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BARE BOOK

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same axils. Calyx not 1 line diameter, with minute teeth. Corolla about 2 lines diameter, divided to the calyx into obtuse lobes. Ovary or calyx-tube in the females ovoid, contracted into a short neck, the corolla smaller than in the males. Staminodia 3, very small. Stigmas reniform or shortly 2-lobed. Berry globular, about $\frac{1}{2}$ in. diameter.—*Cucurbita micrantha*, F. Muell. in Trans. Phil. Soc. Viet. i. 17; *Cucumis? Muelleri*, Naud. in Ann. Sc. Nat. Ser. 4, xi. 84; *Zehneria micrantha*, F. Muell. Fragm. i. 182, and Pl. Viet. t. 18; *Mukia micrantha*, F. Muell. Fragm. ii. 180; iii. 107.

N. S. Wales. Hunter's River, Bauer (in Herb. R. Br.); Darling desert, Dalhousie and Goodwin.

Victoria. Murray river, F. Mueller.

8. MUKIA, Arn.

Calyx in the males, and free part of it in the females, turbinate-campulate, 5-toothed. Corolla rotate, divided to the calyx into 5 acute lobes. Stamens in the males 3, filaments short, free; anthers two with 2 cells, one with 1 cell, the cells parallel and straight, the connective produced into a short point beyond them; the females without staminodia. Ovary in the females with 2 or 3 placentas and several horizontal ovules; style clavate, with a thick 2- or 3-lobed stigma. Fruit a globular berry. Seeds few, compressed, serotile.—Scabrous-hispid annuals, with the habit of *Cucumis*. Leaves angular or rarely lobed. Flowers small, yellow, the males clustered and pedicellate, the females solitary and sessile or nearly so.

Besides the Australian species, which is widely spread over tropical Asia and Africa, there may be a second African one.

1. **M. scabrella**, Arn. in Hook. Journ. Bot. iii. 276. Rather slender, but very scabrous-hispid. Leaves shortly petiolate, deeply cordate, from broadly triangular to ovate-lanceolate, and more or less hirsute with broad rounded or angular lobes, usually obtuse, obscurely crenate or rarely shortly 3- or 5-lobed, mostly under 2 in. long. Male flowers clustered in the axils, the pedicels 2 to 3 lines long; females almost sessile. Calyx hirsute, above 1 line long, with small linear teeth. Corolla lobes about 1 line long. Adnate part of the calyx-tube or ovary in the females about 2 lines long, densely hirsute with long white hairs. Style surrounded by a cup-shaped disk. Berry globular, sometimes attaining $\frac{1}{2}$ in. diameter. Wight, Ic. t. 501; Naud. in Ann. Sc. Nat. ser. 4. xii. 142.

N. Australia. N.W. coast, *Ignor*; Nichol Bay, *Gregory's Expedition* (with deeply lobed narrow leaves); Upper Victoria river and Gulf of Carpentaria, F. Mueller; Port Essington, Armstrong.

Queensland. Keppel and Shoalwater Bays and Northumberland islands, R. Brown; Burdekin and Gilbert rivers, F. Mueller; Port Curtis and Lizard Island, McCallister; N.E. coast, A. Cunningham; Rockingham Bay, Dalhousie, &c.

9. SICYOS, Linn.

Calyx in the males and free part of it above the narrow tube in the females campanulate, with 5 small subulate teeth. Corolla rotate, divided to the calyx into 5 ovate lobes. Stamens in the males united in a column clavate at the top and more or less lobed, with 3 to 5 linear curved and

flexuose anther-cells. Ovary in the females 1-celled with 1 pendulous ovule. Fruit small, dry, ovoid or oblong, acute or beaked, usually covered with prickles.—Prostrate or climbing herbs. Leaves angular or 3- or 5-lobed. Tegbrils 3-branched. Flowers small, the males in racemes sometimes reduced to corymbs or clusters; the females pedicellate in the axils or sometimes in the same raceme with the males.

The genus is spread over the warmer regions of the New and the Old World. The only Australian species is a common American one.

1. ***S. angulata***, *Lin.*; *DC. Prod.* iii. 309. Stems rather slender, but extending sometimes to a great length, glabrous or sparingly scabrous. Leaves on long petioles, from broadly ovate-cordate to almost reniform, usually acutely 3-angled or palmately lobed, the central angle or lobe the longest, of a thin texture and often 3 to 4 in. long or more. Male and female flowers often in the same axil, the males in a short raceme on a long peduncle, the females in a small dense cluster on a very short peduncle. Calyx in the males scarcely above 1 line diameter and the corolla rarely 3 lines, the females still smaller. Fruits ovoid, rarely $\frac{1}{2}$ in. long, densely covered with barbed prickles.—Hook. f. *Fl. Tasm.* i. 143; *S. freitensis*, Hook. f. in Hook. *Lond. Journ.* vi. 473; *S. australis*, *Endl. Prod. Fl. Norf.* 67; A. Gray, *Bot. Amer. Expl. Exped.* i. 648.

Queensland. Moreton Bay, *F. Mueller*.

N. S. Wales. Port Jackson and Blue Mountains, *R. Brown, Wools.*

Victoria. Banks of the Tambo and Gipps' Land, *F. Mueller*.

Tasmania. Islands of Bass's Strait, *Gunn*.

A common weed in tropical and N. America, widely dispersed over the Pacific Isles and New Zealand, but not recorded from Asia or Africa.

A. Gray distinguishes *S. australis* from the common American form chiefly by its smaller flowers. It is not easy to judge of this from dried specimens without soaking, and the size appears variable, but certainly in some Australian specimens quite as large as in the common American forms.

ORDER LV. FICOIDEÆ.

Calyx persistent, free or adnate to the ovary at the base, divided to the middle or to the base into 5 or 4 rarely more or only 3 lobes or segments, imbricate in the bud or very rarely valvate. Petals none or indefinite and narrow, very rarely equal in number to the calyx-segments, inserted at their base. Stamens few or many, usually indefinite, or not corresponding in number to the calyx-lobes, or rarely equal in number to them, inserted on the calyx-tube, or hypogynous when the calyx is divided to the base; filaments free or united in a cup at the base; anthers with parallel cells opening longitudinally. Ovary inferior, half superior or superior, 3- to 5- or more-celled, rarely 2-celled or reduced to a single carpel; styles as many as cells, free or united at the base, usually filiform and stigmatic along the inner side, or rarely with terminal stigmas or very short; ovules 1, 2 or more in each cell usually inserted on a basal placenta more or less adnate to the axis or inner angle of the cell. Fruit a capsule or rarely fleshy or drupaceous, opening loculicidally septicidally or both, in as many or twice as many valves as cells, or transversely circumscissile or indehiscent. Seeds with a cartaceous or rarely not baccate or thick testa, usually compressed. Em-

bryo curved round a mealy albumen. Herb or rarely undershrubs or almost shrubby. Leaves alternate or more rarely opposite, entire, often succulent. Flower either solitary, terminal, leaf-opposed or in the forks of the stems, or in axillary cymes or clusters.

The Order is widely dispersed over the globe, although not extending to very cold regions, the majority of species inhabiting sandy or rocky seacoast, or dry wastes or spreading as weeds of cultivation, and particularly abundant in S. Africa. Of the eight Australian genera, three are generally distributed over the warmer regions of the globe, three are especially South African, with a few of their numerous species dispersed over a wider range, and two small ones are endemic in Australia.

TRIBE I. **Mesembryææ**.—*Calyx-tube adnate to the ovary.*

- Petals numerous, linear. 1. MESEMBRYANTHEMUM.
Petals none 2. TETRAGONIA.

TRIBE II. **Aizoideæ**.—*Calyx free, but with a distinct tube bearing the stamens.*
Petals none.

- Capsule opening in valves.
Stamens indefinite 3. AIZOON.
Stamens 4 4. GUNNIA.
Capsule circumsciss.
Styles and ovary-cells 3 to 5 5. SESUVIUM.
Styles and ovary-cells 2 or 1 6. TRIANTHEMA.

TRIBE III. (or SUBORDER). **Molluginææ**.—*Calyx divided to the base. Petals 5 or fewer or none.*

- Stamens 8, united in a cup at the base. Ovules 1, 2 or rarely 3 in each cell 7. MACARTHURIA.
Stamens few or many, free or rarely slightly united when very numerous. Ovules many or rarely 3 or 4 in each cell 8. MOLLUGO.

TRIBE I. **MESEMBRYÆÆ**.—*Calyx-tube adnate to the ovary, either entirely so, or produced above it.*

1. **MESEMBRYANTHEMUM**, Linn.

Calyx-tube adnate to the ovary; lobes 5 or rarely more or fewer. Petals numerous, linear, in one or more series. Stamens numerous, in several series. Ovary inferior, with 5 or more, rarely 4, cells, each with numerous ovules; styles as many as cells of the ovary, free or connate at the base, stigmatic along the inner side. Capsule surrounded by the persistent calyx, the summit flat and loculicidally dehiscent. Seeds minute, with a crustaceous testa. —Herbs or undershrubs, more or less succulent. Leaves opposite or alternate, fleshy, entire or rigidly ciliate, without stipules. Flowers showy, terminal or in the forks of the branches, or leaf-opposed.

The species are very numerous in S. Africa, a few spreading along the seashore to various parts of the world. Of the four Australian ones here enumerated, one is introduced only, one is included amongst the widely diffused maritime ones, found also in S. Africa, and the remaining two belong probably to the same category, although they have not been absolutely identified with any S. African species.

- Leaves opposite, triquetrous, linear or oblong.
Leaves mostly above 1 in. Flowers about 1½ in. diameter on rather long pedicels 1. *M. æquilatera* 'c.
Leaves mostly under 1 in. Flowers not above 1 in. diameter, sessile or shortly pedicellate in tufts of leaves at the nodes 2. *M. australe*.

Leaves alternate, flat.

Flowers rather small, sessile or shortly pedicellate, terminal or leaf-opposed, white or pink. Leaves undulate, covered with transparent vesicles

3. *M. crystallinum*.

Flowers rather large, yellow, on long pedicels. Leaves lanceolate or spatulate

4. *M. pomeridianum*.

1. *M. æquilaterale*, Haw.; Hook. f. *Fl. Tasm.* i. 146. Perennial, with robust prostrate stems, extending sometimes to a considerable length, with short ascending flowering branches, or sometimes more ascending from the base. Leaves opposite, stem-clasping, thickly linear-triangular, equal-sided or laterally compressed, attaining 2 to 3 in. Flowers rather large, red, pedicellate or nearly sessile within the last small pair of leaves. Calyx-tube turbinate, $\frac{1}{2}$ in. long or rather more; lobes unequal, the 2 larger ones often as long as the tube, with prominent angles decurrent on the calyx and pedicel, or the calyx quite terete. Petals spreading to about $1\frac{1}{2}$ in. diameter. Styles and ovary-cells varying from 6 to 10. Fruit said to be about the size of a good gooseberry.—*M. æquilaterale*, *M. glaucescens*, *M. Rossi*, and *M. nigrescens*, Haw.; DC. *Prod.* iii. 429; Salm-Dyck, *Monogr.* § 19. f. 1, 2, 3; *M. præcox*, F. Muell. in *Linnaea*, xxv. 384.

Queensland. Plains of the Condamine, *Leichhardt*.

Victoria. Along the seacoast in various places, *F. Mueller*, *Robertson*.

Tasmania. Abundant on the seacoast and ascending the rivers as far as their waters are salt, called "Pig's faces," *J. D. Hooker*.

S. Australia. Murray river, Holdfast Bay, Salt plains on the W. side of Flinders Range, *F. Mueller*.

W. Australia. Swan River, *Drummond*, *Oldfield*; Murchison river, *Oldfield*.

The same species is also found on the coasts of Chile and California, and scarcely differs from the S. African *M. acinaciforme*, Linn., except in the leaves not so thick and the flowers smaller.

2. *M. australe*, *Solmsd. in Ait. Hort. Kew.* ed. 1. ii. 187. Perennial, with prostrate stems rooting at the nodes, the flowering branches very short, or reduced to clusters of leaves surrounding the peduncle. Leaves opposite, triangular or somewhat flattened and oblong, obtuse or rarely almost acute, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Flowers reddish, solitary in the axillary clusters of leaves, or terminating very short leafy branches, the pedicels from rather shorter than the leaves to twice their length. Calyx-tube turbinate, 2 to 3 lines long; lobes unequal, the 2 larger ones as long as or rarely longer than the tube, and rarely forming slightly prominent lines decurrent on it. Petals spreading to about 1 in. diameter. Styles and ovary-cells usually 5. — DC. *Prod.* iii. 428; Salm-Dyck, *Monogr.* § 18. f. 2; Hook. f. *Fl. Tasm.* i. 147; *M. clavellatum*, Haw.; DC. *Prod.* iii. 428; Salm-Dyck, *Monogr.* § 18. f. 1; *M. demissum*, Willd. *Enum. Suppl.* 36 (name only, referred to *M. australe* in Link, *Enum. Hort. Berol.* ii. 51).

N. S. Wales. Darling river, *Victorian Expedition* (a bad doubtful specimen).

Victoria. Phillips island, *F. Mueller*.

Tasmania. W. moorh, Circular Head and banks of the Tamar, *Gunn*, *J. D. Hooker*; King's Island, *F. Mueller*.

S. Australia. Seacoast, *F. Mueller*; Murray river, *Blandowski*.

W. Australia. Bad Island, *Oldfield*, *Marshall*; Swan River, *Drummond*, 3rd Coll. n. 59 (leaves $\frac{1}{2}$ to $1\frac{1}{2}$ in. and pedicels 1 to 2 in. long).



Handwritten text, possibly a name or description.

The species is found also on the seacoasts of New Zealand and the islands of the South Pacific, and is probably not really distinct from the S. African *M. crassifolium*, Linn.

3. ***M. crystallinum*, Linn.; DC. Prod. iii. 448.** Annual, prostrate and much-branched, the thick stems under 1 ft. long and covered, as well as the foliage, with transparent vesicles, to which it owes the name of "Ice Plant." Radical leaves broadly cordate-ovate; stem-leaves alternate, flat but succulent, from broadly obovate to obovate-oblong, much undulate, obtuse, narrowed into a stem-clasping petiole. Flowers not large, on very short terminal or leaf-opposed pedicels, the upper ones forming a loose leafy cyme. Calyx 3 to 4 lines diameter, the lobes short and obtuse or rarely longer and lanceolate. Petals white or pink, spreading to about $\frac{1}{2}$ in. diameter. Styles and ovary-cells 5.—Sibth. Fl. Græc. t. 451; DC. Pl. Grass. t. 128.

S. Australia. Holdfast Bay and Port Adelaide, *F. Mueller.*

W. Australia. Swan River, *Drummond.*

A common seacoast plant in S. Africa, found also on the coasts of the Canary Islands, southern Europe, and California.

* 4. ***M. pomeridianum*, Linn.; DC. Prod. iii. 450.** Annual, decumbent or ascending, under a foot high, pubescent with a few soft hairs especially on the inflorescence and margins of the leaves. Leaves alternate, flat but succulent, lanceolate or spatulate, often 2 to 3 in. long. Flowers rather large, pale yellow, on long peduncles, terminal or in the forks. Calyx-tube above $\frac{1}{2}$ in. diameter; lobes very unequal, the longest $\frac{3}{4}$ in. long. Petals very numerous in several rows. Styles and ovary-cells 12 or more.—Bot. Mag. t. 540; Salm-Dyck, Monogr. § 65. f. 1.

A South African species, naturalized on the Darling river, *Dallachy.*

2. **TETRAGONIA**, Linn.

(*Tetragonella*, *Miq.*)

Calyx-tube adnate to the ovary at the base and usually produced above it; lobes 4 or 5, or rarely 3. Petals none. Stamens indefinite, few or many, inserted at the top of the calyx-tube, free but usually in clusters alternating with the lobes. Ovary inferior, 2- to 8-celled, with 1 pendulous ovule in each cell, the summit convex or conical, and rarely containing a second erect ovule. Styles as many as cells, linear, stigmatic along the inner side. Fruit indehiscent with a hard almost bony endocarp, the herbaceous or almost fleshy epicarp (or persistent calyx) often variously horned or tubercular.—Herbs or undershrubs. Leaves alternate, flat but rather thick, without stipules. Flowers solitary or few together in the axils, sessile or pedicellate, usually of a yellowish or reddish-green.

The species comprises several S. African species, besides a few dispersed over the seacoasts of New Zealand, the Pacific islands, and some parts of Asia and America. Of the two Australian species, one is also in New Zealand and extratropical S. America and Asia, the other is endemic.

Flowers usually hermaphrodite, with 3 or usually more styles and ovary-cells. Fruit often horned

Flowers mostly unisexual, with 2 or very rarely 3 styles and ovary-cells. Fruit never horned

1. *T. expansa.*

2. *T. implexicoma.*

1. ***T. expansa*, Muerr.; DC. Prod. iii. 452.** Decumbent or prostrate,

often extending to several feet. Leaves petiolate, the larger ones ovate, triangular or broadly hastate, 2 to 4 in. long, entire, obtuse or acute, the smaller ones narrower. Flowers small, yellow, on very short pedicels or almost sessile in the axils, solitary or 2 together. Calyx-tube broadly turbinate, a little above 1 line diameter; lobes broad and obtuse, about as long as the tube. Stamens in clusters of 3 or 4 opposite each sinus of the calyx. Ovary half-inferior, the free portion depressed-hemispherical, with 3 to 8 external furrows and as many cells. Fruit hard, $\frac{1}{4}$ to $\frac{1}{2}$ in. diameter, from nearly globular and almost without protuberances to turbinate, angular, with 2, 3 or more hard prominent horns, the endocarp woody.—Hook. f. *Fl. Tasm.* i. 147; *Bot. Mag.* t. 2362; Payer in *Ann. Sc. Nat.* ser. 3, xviii. t. 13; *T. inermis*, F. Muell. in *Linnæa*, xxv. 384.

Queensland. Brisbane river, Moreton Bay, *C. Stuart*.

N. S. Wales. Port Jackson, *J. D. Hooker*; Hastings river, *Beckler*; in the interior at the camp at Meninville, *Victorian Expedition*.

Victoria. Port Phillip, *R. Brown*; Sealers' Cove, *F. Mueller*.

Tasmania. Northern shores, *J. D. Hooker*.

S. Australia. Elders Range, Lake Torrens, *F. Mueller*.

The species is also on the coasts of New Zealand, extratropical S. America, and Japan, and has been cultivated in Europe as "New Zealand Spinach."

2. ***T. implexicoma***, *Hook. f. Fl. Tasm.* i. 148. Decumbent or almost climbing. Leaves petiolate, ovate or rhomboidal, usually smaller than in *T. expansa*, and often much narrower or quite oblong, usually covered with transparent vesicles like the Ice-plant. Pedicels filiform, solitary or 2 together in the axils on young leafy shoots. Flowers polygamo-diacious, the males with a narrow calyx-lobe, the lobes nearly 2 lines long and valvate; stamens in clusters of 3 or 4 opposite the sinuses. Perfect flowers with a broader calyx-tube. Ovary 2-celled or rarely 3-celled, the lower part adnate, with 1 pendulous ovule in each cell, the free part conical, sometimes with 1 erect ovule in each cell, and circumscissily deciduous after flowering. Fruit smaller than in *T. expansa*, 3 to 4 lines long including the red succulent calyx, with irregularly prominent ribs or tubercles, but not horned. Seeds 1 or rarely 2. *F. Muell. Pl. Vict.* t. 13; *Tetragonella implexicoma*, *Miq. in Pl. Preiss.* i. 245.

Victoria. Port Phillip, *F. Mueller*, *Harvey*, and others; mouth of the Glenelg, *F. Mueller*.

Tasmania. Abundant on all the coasts, sometimes festooning the bushes on the shore, *J. D. Hooker*.

S. Australia. Lower Murray river, St. Vincent's Gulf, etc., *F. Mueller*.

W. Australia. Rottenest Island, *Preiss, n.* 2393.

TRIBE II. AIZOIDEÆ.—Calyx free, but with a distinct turbinate tube, bearing the stamens at or below the top.

3. AIZOON, Linn.

Calyx free, deeply 4- or 5-lobed. Petals none. Stamens indefinite, usually about 20, inserted at the top of the calyx-tube, free, but more or less in clusters alternating with the lobes. Ovary superior, enclosed in the calyx-tube, 5-celled or in the Australian species 4-celled, with 2 or more ovules in



Melaleuca Wilsoni.

each cell; styles as many as cells, filiform, stigmatic along the inner side. Capsule surrounded by the persistent calyx, depressed, opening loculicidally in as many valves as cells, or in the Australian species the valves split septici-
cidally.—Herbs or undershrubs. Leaves alternate or rarely opposite, without stipules. Flowers solitary or divaricately cymose.

The genus is chiefly African, and especially S. African, but extending to N. Africa and S. Europe. The only Australian species is endemic, and differs from the African ones in habit, in its 4-merous flowers, in the calyx valvate, not imbricate in the bud, and in the dehiscence of the capsule. In this respect it is more nearly allied to *Gunnia*, to which it ought perhaps to be referred, but the stamens are numerous as in *Aizoon*. The opposite leaves occur also in one of the S. African species.

1. **A. quadrifidum**, *F. Muell. Fragm.* ii. 118. A rigid shrub, probably small, with divaricate opposite or dichotomous branches, covered as well as the leaves with a dense but close almost scurfy tomentum. Leaves opposite, narrow-linear, obtuse, rather thick and soft, not above $\frac{1}{2}$ in. long in the specimens. Flowers shortly pedicellate, terminal or in the forks, resembling in shape and size those of *A. hispanicum*. Calyx tomentose; tube short, broadly turbinate, the ribs not prominent; lobes 4, valvate, ovate-acuminate, about $\frac{3}{4}$ lines long. Stamens numerous, densely crowded opposite the sinus of the calyx, more distant opposite the lobes; filaments slender, more or less covered like the ovary with transparent vesicular cells, about as long as the calyx-lobes. Ovary truncate on the top, 4-angled, 4-celled, with 4 styles stigmatic along their inner side. Ovules numerous. Capsule almost free, obpyramidal-truncate, septici-
cidally dehiscent in 4 truncate valves, loculicidally divided almost to the base.—*Sesuvium quadrifidum*, *F. Muell. Rep. Babb. Exped.* 9.
N. S. Wales. Towards the Barrier Range, between Duroodoo and Nangavera, *Victorian Expedition*.

S. Australia. Desert at Stuart's Creek, *Hergott*.

4. GUNNIA, *F. Muell.*

Calyx free, deeply divided into 4 lobes, valvate in the bud. Petals none. Stamens 4, inserted on the calyx-tube and alternating with its lobes. Ovary superior, enclosed in the calyx, 4-celled, with several ovules in each cell; styles 4, filiform, stigmatic along the inner side. Capsule enclosed in the persistent calyx, opening loculicidally, each valve splitting septici-
cidally. Seeds numerous, small; testa thin and smooth; embryo curved round a mealy albumen. Small diffuse annuals. Leaves opposite. Flowers terminal or in the forks, nearly sessile.

The genus is limited to Australia.

Leaves linear

Leaves ovate

1. *G. septifraga*.

2. *G. Drummondii*.

1. **G. septifraga**, *F. Muell. Rep. Babb. Exped.* 9. The specimens described from one small fragment, but are evidently allied to *G. Drummondii*. The branches appear to be more slender, the single pair of floral leaves preserved are linear. Flowers nearly sessile in the forks or terminal. Calyx-lobes acute, about $1\frac{1}{2}$ lines long when in flower, 2 lines long when in fruit.

S. Australia. Stuart's Creek, *Hergott*.

2. **G. Drummondii**, *Benth.* A diffuse annual, with opposite branches,

the whole plant in our specimens scarcely exceeding 2 in. Leaves opposite, petiolate, ovate or ovate-oblong, 2 to 4 lines long. Flowers large for the plant, sessile or nearly so in the forks and at the ends of the branches. Calyx-tube short, turbinate; lobes 4, valvate, broadly ovate, acute, nearly 3 lines long when closed over the fruit. Stamens 4, inserted below the middle of the calyx-tube and about as long as its lobes. Capsule contracted and very shortly adnate at the base, broad in the centre, pyramidal and 4-angled at the top, opening both loculicidally and septically. Seeds numerous.

W. Australia. *Drummond, n. 241.*

5. *SESUVIUM*, Linn.

Calyx free, deeply 5-lobed. Petals none. Stamens 5, alternating with the calyx-lobes or indefinite, often very numerous, inserted at the top of the tube. Ovary free, enclosed in the calyx, 3- to 5-celled, with numerous ovules in each cell; styles as many as cells, filiform, stigmatic along the inner side, at least towards the end. Capsule surrounded by the persistent calyx, membranous, more or less completely divided by very thin dissepiments, transversely circumsciss about the middle. Seeds several; testa coriaceous, smooth. —Herbs or undershrubs. Leaves opposite, fleshy, without stipules, but sometimes with scarious dilatations of the petiole. Flowers solitary or clustered in the axils or almost cymose, the calyx-lobes usually coloured inside, with more or less scarious margins.

The genus contains about four species, spread over the seacoasts of the tropical and sub-tropical regions of the globe, the Australian species being the commonest and the most generally diffused both in the New and the Old World.

1. *S. portulacastrum*, Linn.; *DC. Prod.* iii. 453. A succulent herb, procumbent or creeping and rooting at the joints. Leaves linear or linear-oblong, contracted below the middle, broader and stem-clasping at the base, mostly 1 to 2 in. long, rather thick, flat above, convex underneath. Pedicels from very short to rather longer than the calyx. Calyx 3 to 4 lines long or sometimes more, the tube turbinate, $\frac{1}{2}$ to 1 line long; lobes ovate-lanceolate, green on the back, scarious on the margins and pink or purple inside, often shortly mucronate below the end. Stamens very numerous, inserted at the top of the calyx-tube and shorter than its lobes, the filaments sometimes shortly united at the base. Ovary 3- or rarely 4-celled. Capsule ovoid, not exceeding the calyx, circumsciss below the middle.—*Bot. Mag.* t. 1701.

N. Australia. Albert river, *Henne*.

Queensland. E. coast, *R. Brown*; Port Curtis, *McGillivray*; Howicks Group and sandy shores of the islands of Moreton Bay, *F. Mueller*; Fitzroy river, *Thozet*.

N. S. Wales. Clarence river, *Wilcox*.

The styles are free to the base in all the flowers I have examined, but are occasionally 4 in number, as in *Psammaalthe marina*, Hance in Walp. Ann. ii. 660, from the Chinese coasts, which appears to be a variety only of *S. portulacastrum*, notwithstanding that the styles are really, as described by Hance, shortly united at the base.

S. repens, Roth, to which the Indian specimens are referred in Wight and Arn. Prod. 361, appears to be a variety or rather a state only of *S. portulacoides*, with smaller flowers and shorter and broader leaves, owing, as suggested by Arnott, to want of luxuriance.

6. **TRIANTHEMA**, Linn.

(Ancistrostigma, Fenzl.)

Calyx free, more or less deeply 5-lobed. Petals none. Stamens inserted at the top of the calyx-tube, either 5 alternating with its lobes or indefinite. Ovary free or nearly so, enclosed in the calyx, either 2-celled with 2 styles, or 1-celled (reduced to 1 carpel) with 1 excentric or lateral style; ovules 2 or more in each cell, attached to a basal placenta, free or shortly adnate to the partition. Capsule membranous or hard, transversely circumsciss, and when 2-celled the upper portion sometimes separating septically into 2 cocci, and in some species, not Australian, divided inside by a transverse partition under the uppermost seed. Seeds orbicular or reniform, the testa often granular.—Prostrate or diffuse herbs, rarely woody at the base. Leaves opposite, the two of each pair unequal in size, the petioles often with a scarious dilatation at the base, but no real stipules. Flowers axillary, solitary or in cymes or clusters. Bracts and bracteoles often somewhat scarious.

The genus is dispersed over the tropical and subtropical regions of the New as well as the Old World. Of the 6 Australian species, 2 are widely distributed over the warmer regions of Asia and Africa, the 4 others are endemic.

Ovary and fruit 2-celled, truncate or concave at the top. Styles 2.
Flowers clustered

Ovary and fruit 1-celled, with 1 style. 1. *T. decandra*.

Ovary and fruit truncate or concave at the top. Flowers clustered.

Glabrous or slightly pubescent. Stamens 5. Capsule short and broad

Hirsute with long hairs. Stamens about 20. Capsule with a narrow beak 2. *T. crystallina*.

Ovary and fruit acute or tapering into the style, or rounded at the top. 3. *T. pilosa*.

Glabrous or sparingly pubescent. Flowers solitary, pedicellate, not very small

Hirsute, small and densely tufted. Flowers solitary in the axils, but crowded on the plant, small 4. *T. orycalyptra*.

Glabrous. Flowers small, in loose pedunculate cymes 5. *T. rhynchoalyptra*.

6. *T. cypseleoides*.

1. ***T. decandra*, Linn.; DC. Prod. iii. 352.** Procumbent and glabrous, said to be annual, but the specimens sometimes show a hard woody base; branches dichotomous, rarely attaining 1 ft. Leaves from broadly obovate to oblong, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, narrowed into a rather long petiole. Flowers several together in a cluster, not exceeding the petiole, although sometimes very shortly pedunculate. Bracts and bracteoles small and scarious. Calyx about 1 line long when in flower, somewhat enlarged when in fruit, the lobes longer than the tube, scarious on the margin and mucronate close to the end. Stamens 10 to 12 or sometimes a few more. Ovary ovoid, truncate, with a few prominent tubercles, 2-celled; ovules 2 in each cell, collaterally ascending from a basal placenta, shortly adnate to the dissepiment; styles 2. Capsule about 2 lines long, the seeds superposed in each cell, the upper one ascending the lower one pendulous; when ripe the upper portion separating into 2 cocci, opening on the inner face, the lower portion circumsciss below the insertion of the seeds. Seeds black, rugose.—Wight, Ic. t. 296; F. Muell. Fragm. i. 172.

N. Australia. N.W. coast, *A. Cunningham*, *Bynoe*.

Queensland. Dawson and Barroet rivers, and Peak Downs, *F. Mueller*; Fumal Creek, *Bowman*.

N. S. Wales. Darling desert to Cooper's Creek, *Victorian Expedition*, *Hovell's Expedition*, etc.

2. ***T. crystallina***, *Vahl*, *DC. Prod.* iii. 352. Glabrous or slightly pubescent or covered with little transparent vesicles, prostrate or diffuse, the wiry dichotomous stems sometimes extending to 1 or 2 ft., sometimes short and compact. Leaves from oval-oblong to linear. Flowers small, in axillary cymes or clusters, much shorter than the leaves. Calyx about $1\frac{1}{2}$ lines long, the lobes narrow, obtuse, spreading, rather longer than the tube. Stamens 5. Ovary of 1 carpel, truncate, with 2 erect ovules; style excentric. Capsule short and broad, the top concave, forming a short broad cup round the style. Seeds 2, granular, flat, obliquely superposed. *Wight and Arn. Prod.* 355; *F. Muell. Fragm.* i. 171; *T. glaucifolia*, *F. Muell. Fragm.* i. 172.

N. Australia Lower Victoria river, *F. Mueller*; in the interior, *M. Druett Stuart*.

Queensland. Broad Sound, *R. Brown*; Burdekin and Dawson rivers, *F. Mueller*; Cape river, *Bowman*.

The species is common in tropical Asia and Africa.

3. ***T. pilosa***, *F. Muell. Fragm.* i. 174. Proerumbent, from a few inches to above 2 ft. in length, hirsute, with spreading hairs, particularly long and dense about the inflorescence. Leaves obovate, narrowed into a rather long petiole, the largest attaining about 1 in. Flowers in axillary sessile clusters. Calyx when full grown about 3 lines long; lobes ovate-lanceolate, very open, as long as the tube. Stamens about 20. Ovary of 1 carpel, the style lateral, below the end, which soon closes round it; ovules 2. Capsule included in the calyx, produced into a cylinder concave or cup-shaped at the top round the style, circumsciss about the middle of the basal seed-bearing portion.

N. Australia. N.W. coast, *Bynoe*; Cygnet Bay, *A. Cunningham*; Nichol Bay and De Grey river, *Rodley's Expedition*; desert between Hooker's and Sturt's Creeks, *F. Mueller*; islands of the Gulf of Carpentaria, *R. Brown*.

4. ***T. oxycalyptra***, *F. Muell. Fragm.* i. 173. Prostrate, rather slender, glabrous or sparingly pubescent. Leaves obovate ovate or spatulate, obtuse or almost acute, mostly under $\frac{1}{2}$ in. long and narrowed into a long petiole. Flowers solitary, more or less pedicellate. Calyx 3 to 4 lines long; lobes rather longer than the tube. Stamens about 15 to 20. Ovary of 1 carpel, the style terminal; ovules about 4 or 5. Capsule rather broad, acute, circumsciss below the middle. Seeds 2 to 5, superposed, compressed, elegantly marked with radiating rows of papillæ.

N. Australia. Sturt's Creek, *F. Mueller*.

5. ***T. rhynchocalyptra***, *F. Muell. Fragm.* i. 174. Perennial, forming dense prostrate tufts, sometimes only 2 or 3 in. diameter, sometimes woody at the base, the branches extending to 6 in., more or less hirsute, with rigid bristly or soft spreading hairs. Leaves oval or oblong, obtuse, rarely above $\frac{1}{2}$ in. long, narrowed into a short petiole. Flowers sessile and crowded, although solitary in each axil. Calyx thin and membranous, rather narrow, about 2 lines long or rather more when in fruit, the lobes scarcely so long as the tube. Stamens about 10. Ovary of 1 carpel obliquely tapering into

the style, which is rather long and recurved. Ovules about 5 or 6, on panicles of various lengths on a short placenta. Capsule acute, circumsciss below the middle. Seeds 2 to 5, minutely granulose.

N. Australia. Sandy stony hills and plains, Victoria river, *F. Mueller*; islands of the Gulf of Carpentaria, *R. Brown*.

6. **T. cypseleoides**, *Benth.* Glabrous, prostrate, slender and very small. Leaves obovate or orbicular, scarcely above $\frac{1}{4}$ in. long in the specimens seen, on slender petioles dilated at the base into scarious stipules. Flowers small, in loose axillary pedunculate cymes exceeding the leaves, with scarious bracts under the forks and pedicels. Pedicels slender, about 1 line long. Calyx about 1 line long, the lobes broad, obtuse, rather longer than the tube. Stamens 7 to 10. Ovary of 1 carpel short and rounded, with 6 to 12 ovules on funicles of various lengths; style terminal, but slightly ex-centrical, linear and recurved. Capsule globular, circumsciss. Seeds smooth.

—*Ancistrostigma cypseleoides*, Fenzl, Nov. Stirp. Decad. 85.

N. S. Wales. Hawkesbury river, *R. Brown*; also in *Leichhardt's* collection.

TRIBE III (or SUBORDER). MOLLUGINÆ.—Calyx free, divided to the base or nearly so.

When the calyx is divided quite to the base, the stamens, inserted as in the rest of the Order below the lobes, are necessarily hypogynous. In a few species the base of the calyx is slightly developed and then the stamens are somewhat perigynous. The group has been frequently referred to *Caryophyllæ* or to *Portulacæ*, with both of which as with *Ficoideæ*, *Phytolaccææ*, *Chenopodiaceæ*, *Amarantaceæ*, etc., it agrees in the seeds and embryo. It differs however both from *Caryophyllæ* and *Portulacæ* in the divided ovary as well as in habit, and although certainly allied to those two as well as to *Phytolaccææ*, it appears to me to be much more closely connected with the tribe *Aizoideæ* of *Ficoideæ* through *Trianthema*. Like all the *Ficoideæ* it is remarkable for the general want of symmetry between the stamens and the other parts of the flower.

7. MACARTHURIA, Hueg.

Calyx-segments 5, persistent. Petals 5 or none. Stamens 8, slightly perigynous, the filaments united in a cup at the base. Ovary free, enclosed in the calyx, 3-celled, with 1, 2, or 3 ovules in each cell, attached to a basal placenta; styles 3, with small terminal stigmas. Capsule enclosed in the persistent calyx, opening loculicidally in 3 valves. Seeds reniform or subglobose, the funicle expanded into a small cup-shaped white arillus.—Rigid waxy or rush-like herbs or undershrubs. Leaves few, alternate, narrow, often all reduced to scales. Flowers small, in lateral or terminal short irregular cymes, or forming a spreading dichotomous cyme with opposite bracts.

The genus is confined to Australia.

Flowers in compact lateral or terminal cymes (sometimes reduced to 1 or 2 flowers).

Flowers $\frac{1}{2}$ to $\frac{3}{4}$ line long, without petals. Ovules solitary in each cell of the ovary.

Flowers $1\frac{1}{2}$ lines long, with petals. Ovules 2 or 3 in each cell of the ovary.

Flowers in loose dichotomous terminal cymes, with petals. Floral leaves or bracts often opposite. Ovules solitary in each cell of the ovary.

1. *M. apulaha*.

2. *M. australis*.

3. *M. newmaniana*.

1. ***M. apetala*, Harv. in Hook. Kew Journ.** vii. 55. Perennial, with the erect rush-like or wiry stems of *M. australis*, but much smaller and more slender, usually forming dense tufts of 6 to 8 in. Leaves linear, few and small, many of them reduced to small scales. Flowers much smaller than in *M. australis*, in little cymes, either lateral or in the forks of the branches. Calyx-segments obtuse, scarcely above $\frac{1}{2}$ line long, shortly united at the base. Petals none. Stamens much more perigynous than in *M. australis*. Ovules 1 in each cell of the ovary; styles exceedingly short. Fruiting-calyx slightly enlarged, but not exceeding $\frac{3}{4}$ line.

W. Australia. Swan River and to the northward, *Drummond*, n. 10 and 677.

2. ***M. australis*, Heg. Exon.** 11. Stems from a perennial stock, erect, virgate or rush-like, slightly branched, 1 to 2 ft. high. Leaves few and distant, long and linear or the lower ones shorter and broader, or all reduced to small scales, the stems then appearing quite leafless. Flowers in short cymes or clusters, often intermixed with a few small floral leaves or scale-like bracts, nearly sessile along the branches or terminating short leafy branchlets, or loose, irregular and few-flowered. Pedicels 1 to 2 lines long. Calyx-segments about $1\frac{1}{2}$ lines long, the outer ones green, the inner more scarious. Petals scarcely exceeding the sepals, oblong. Ovules 2 or 3 in each cell of the ovary.—Hook. Ic. Pl. t. 408; Steud. in Pl. Preiss. i. 229; Steetz in Pl. Preiss. ii. 359; *M. foliosa*, Steud. l. c. 230; Steetz, l. c. 360 (from the description).

W. Australia. King George's Sound to Swan River, *Haege*, *Drummond*, 1st Coll., *Preiss*, n. 1671, 1672, and others; Murchison river, *Oldfield*.

3. ***M. neocambrica*, F. Muell. Fragm.** v. 28. A diffuse plant of 6 to 8 in. (*F. Mueller*). Stem-leaves few, alternate, oblong-linear or linear-cuneate, rather thick. Flowers in a broad loose spreading dichotomous cyme or panicle, each one pedicellate in the forks or terminal. Floral leaves or bracts very small, mostly opposite or nearly so. Calyx about 1 line long. Petals about as long as the calyx, perhaps sometimes wanting. Ovules 1 in each cell of the ovary; styles rather short.

N. S. Wales. Tweed river, *C. Moore*. The specimens seen not perfect.

8. MOLLUGO, Linn.

(*Glinus*, Linn.; *Trigastrotheca*, *F. Muell.*)

Calyx-segments 5, persistent. Petals none. Stamens few or many, free, sometimes with the addition of a few staminodia, of which 1 to 5 external ones represent petals, alternating with the calyx-segments. Ovary 3- to 5-celled, with several ovules in each cell; styles as many as cells, linear or clavate. Capsule membranous, enclosed in the persistent calyx, opening loculicidally in as many valves as cells. Seeds with a smooth or granulate testa, the funicle sometimes thickened into a small white arillus or strophiole, with or without a filiform appendage.—Erect or diffuse herbs, mostly annual. Radical leaves rosulate, but often disappearing before the flowering. Stem-leaves alternate, but often clustered in the axils so as to appear verticillate. Stipules very small and fugacious. Flowers small, the pedicels usually clustered in the axils, sometimes forming cymes, umbels, or racemes.

The genus is abundantly diffused over the warmer regions of the globe, extending into Europe and North America. Of the five Australian species, three are very common in Asia and Africa, two of them extending also to tropical America, the other two are endemic.

SECTION I. **Glinus.** *Seeds strophiole, with a filiform appendage (resembling a funicle) more or less encircling them.*

- Softly tomentose. Flowers rather large, in axillary clusters. Stamens about 10 to 15. 1. *M. Glinus.*
 Quite glabrous. Flowers rather large, in terminal clusters. Stamens about 15. 2. *M. orygioides.*
 Glabrous or slightly pubescent. Flowers rather small, in axillary clusters. Stamens under 10 3. *M. Spergula.*

SECTION II. **Mollugo.**—*Seeds without any strophiole.*

- Glabrous, decumbent. Flowers rather large in loose axillary cymes or racemes. Stamens 5, the filaments much dilated at the base 4. *M. trigaster thora.*
 Glabrous, filiform, and small. Flowers small, on filiform pedicels. Stamens 5, the filaments not dilated 5. *M. Cerviana.*

1. **M. Glinus**, *A. Rich. Fl. Abyss. i. 48.* A rather coarse species, softly tomentose all over, sometimes small and erect, but usually diffuse, procumbent or ascending and spreading to above 1 ft. Leaves from obovate-orbicular to oblong-spathulate, sometimes above 1 in. long, but usually much smaller. Flowers clustered at the nodes on short pedicels rarely as long as the calyx. Calyx like the rest of the plant, very tomentose, segments $2\frac{1}{2}$ to 4 lines long. Stamens about 10 to 15, with 5 or fewer external staminodia, flat, very thin and transparent, often forked. Styles usually 3, united at the base. Capsule enclosed in the calyx, 5-lobed. Seeds numerous; testa tuberculate, funicle thickened into a short strophiole or arillus, with a long filiform hair-like white process more or less encircling the seed.—*Glinus loloides*, *Lim. Spec. Pl. 663*; *Fenzl, in Ann. Wien. Mus. i. 357*, with the synonyms adduced; *F. Muell. Pl. Viet. i. 202*.

N. Australia. Victoria river, *F. Mueller.*

Queensland. Rockhampton, *Thozet.*

N. S. Wales. Darling river, *Dallachy and Goodwin.*

Victoria. Sandy occasionally inundated banks of the Murray river, *F. Mueller.*

Widely dispersed over the tropical and subtropical regions of the Old World, extending to Europe, and found also in various parts of tropical America. There is a less tomentose variety with smaller flowers, approaching *M. Spergula*, which however has not yet been found in Australia.

2. **M. orygioides**, *F. Muell. Herb.* Stout and rigid, apparently perennial, dichotomously branched, quite glabrous. Leaves obovate or oblong, all under $\frac{1}{2}$ in. in our specimens. Flowers rather large, in terminal clusters, on very short pedicels. Outer calyx-segments about 2 lines long, with a narrow scarious border, inner ones rather larger at first, with a broader border, at length 3 lines long, broadly-ovate, white and scarious, with a greenish centre. Stamens about 15, with a few staminodia, either all subulate or 2 or 3 flat thin and transparent. Styles 3 or rarely 4, quite free. Seeds not numerous, larger than those of *M. Glinus*, and the hair-like appendage to the funicle not so long, only half encircling the seed. —*Glinus orygioides*, *F. Muell. Pl. Viet. i. 203*.

N. S. Wales. Desert plains, east of Gray Range, *Bickler.*

S. Australia. Cooper's Creek, *Wright.*

3. **M. Spergula**, *Linn. Spec.* 131. Glabrous or somewhat pubescent when young, much and dichotomously branched, procumbent and spreading to 1 ft. or more, or nearly erect when small. Leaves from obovate-oblong to almost linear, sometimes almost 1 in. long, much smaller on the flowering branches. Flowers in small clusters at the nodes, the pedicels as long as or longer than the calyx. Calyx-segments glabrous, from 1 to nearly $1\frac{1}{2}$ lines long. Stamens not above 10 and usually much fewer, with occasionally a few staminodia amongst them. Styles or style-branches and capsule-valves 3. Seeds rather numerous, the funicle thickened into a small arillus, with a filiform process more or less encircling the seed as in *M. Glinus*.—*Glinus Mollugo*, Fenzl in Ann. Wien. Mus. i. 359, with the synonyms adduced; F. Muell. Pl. Vict. i. 203; *M. Nova-Hollandicæ*, F. Muell. in Trans. Phil. Soc. Vict. i. 14; *M. glinoides*, A. Rich. Fl. Abyss. i. 48, not of Cambess.

N. Australia. Victoria river and towards M'Adam Range, *F. Mueller*.

Victoria. Sandy periodically inundated banks of the Murray and its backwaters, *F. Mueller*.

W. Australia. *Drummond, 4th Coll. n. 166, 5th Coll. n. 276.*

The species is common in tropical Asia and Africa.

4. **M. trigastrotheca**, *F. Muell. Pl. Vict. i. 201.* Glabrous, decumbent or diffuse, dichotomously branched, under 1 ft. long. Leaves linear, clustered so as to appear verticillate, acute, often exceeding 1 in. Flowers rather large, in loose cymes or branched racemes often as long as the leaves. Calyx-segments about 2 lines long, white and petal-like, with a green centre. Stamens usually 5, the filaments much dilated below the middle. Ovary membranous, soon inflated, 3-celled, with 3 or 4 ovules in each cell; styles rather long, with small terminal stigmas. Capsule depressed-globular, membranous, 3-furrowed, 3-valved. Seeds few, tuberculate, without any appendage to the funicle.—*Trigastrotheca molluginæa*, F. Muell. in Hook. Kew Journ. ix. 16.

N. Australia. Depuech island, N.W. coast, *Bynoe*; Hearson island, Nichol Bay, *Walcott*; Stuart's Creek and Arnhem's Land, *F. Mueller*.

5. **M. Cerviana**, *Ser. in DC. Prod. i. 392.* A little slender glabrous annual of a few in., with filiform branches. Leaves in distant clusters, linear, mostly under $\frac{1}{2}$ in. long, the radical ones sometimes shorter and oblong. Pedicels filiform, longer than the leaves. Calyx-segments about $\frac{1}{2}$ line long when in flower, lengthening to nearly 1 line. Stamens usually 5, the filaments filiform from the base. Styles 3, short, distinct, stigmatic towards the end. Seeds numerous, small, without any appendage to the funicle.—Fenzl in Ann. Wien. Mus. i. 379; F. Muell. Fragm. ii. 148.

N. S. Wales. Towards the Barrier Range, *Victorian Expedition*.

S. Australia. Near Lake Gillies, *Burkitt*.

The species is diffused over tropical and subtropical Asia and Africa and southern Europe.

ORDER LVI. UMBELLIFERÆ.

Calyx-tube adnate to the ovary; limb forming a slightly raised line round the summit, or 5-toothed or lobed, or quite inconspicuous. Petals 5, usually inflexed at the tip, more or less imbricate or very rarely valvate in the bud.

Stamens 5, alternating with the petals and inserted with them round the epigynous disk at the summit of the calyx-tube; anthers versatile, with parallel cells opening longitudinally. Epigynous disk within the stamens usually 2-lobed, variously shaped, free from the styles or confluent with their thickened base and therefore the disk-lobes often called *styleptolobes*. Ovary inferior, 2-celled or very rarely 1-celled by abortion, with 1 anatropous ovule in each cell, pendulous from the summit. Styles 2, with small terminal stigmas. Fruit usually separating into 2 indehiscent 1-seeded nuts or carpels, called *mericarps*, often leaving a persistent filiform central axis called a *carpopphore*, either entire or splitting into two. Each carpel is marked with longitudinal *ribs*, of which the primary ones corresponding with the calyx-teeth and intervening sinuses) are normally 5 to each carpel, *i.e.* 2, *lateral* (one on each side) at the *commissure* or junction of the 2 carpels, 1 *dorsal* on the back of the carpel, and 2 *intermediate* between the dorsal and lateral one on each side, but some of these are occasionally inconspicuous, and in some genera 4 *secondary* ribs to each carpel, between the primary ones, are as conspicuous or more prominent than the primary ones. In many genera there are longitudinal linear oil-vessels called *cittæ*, within or under the pericarp. Seed often adhering to the pericarp; testa very thin; albumen horny, filling the seed or furrowed or excavated on the inner face (next the commissure). Embryo minute near the apex of the seed, with the radicle superior. — Herbs or very rarely shrubs, with alternate leaves, often much cut or divided, the petiole usually dilated into a sheathing base, but without distinct stipules, except in *Hydrocotyle*. Flowers usually small, in terminal or lateral (leaf-opposed) umbels, which are either compound, each ray of the general umbel bearing a partial umbel, or simple or reduced to a globular head. Bracts at the base of the general umbel, either one under each ray or fewer, termed the general *involucre*, and one or three or more under the partial umbel termed the *involucel* or *partial involucre*, or one or both involucres wanting. Flowers frequently more or less polygamous, some, in the same or different umbels from the perfect ones, being males by the constant abortion of the ovary, and occasionally one or a few in the centre of the umbel females without stamens.

A numerous Order, more or less represented nearly all over the globe, especially in the temperate region of the northern hemisphere, where the delimitation of the very numerous genera presents the greatest difficulties. The Australian genera are much more marked, two or three only being rather uncertain in their connection with northern ones. Of the 14 genera here enumerated four have a very wide range within as well as without the tropics in both hemispheres, one, *Seseli*, is more specially characteristic of the temperate regions of the Old World, three range over Andine and Amaretic America and New Zealand, *nam.* *Acrophyllum*, extends to New Zealand and the Antarctic islands only, another, *Trachymene*, extends only to New Caledonia and Porpo, the remaining four are endemic.

Stems laterally compressed, without vitæ. Seeds laterally compressed. Umbels simple.

Climbing perennials or slender annuals with scarious stipules. 1. HYDROCOTYLE.

Annuals or perennials, with dissected or toothed leaves without stipules. Fruit very flat 2. TRACHYMENE.

Leafless plant with rush-like stems 3. SIEBERA.

Umbels compound, sometimes reduced to 1 or 2 flowers with bracts under the flower as well as under the pedicel.

(Calyx-teeth small or inconspicuous. Perennials or shrubs, usually

- glabrous. Leaves entire or ternately divided into small narrow lobes. Involucral bracts small 3. *SIEBERA*.
- Calyx-lobes peltate, cordate or usually attached by the whole of their broad base. Herbs villous or glabrous. Leaves toothed, lobed or divided, or rarely entire. Involucral bracts conspicuous 4. *XANTHOSIA*.
- Fruits scarcely compressed or compressed dorsally, without vittæ, usually furrowed at the commissure. Seed terete or dorsally compressed.
- Umbels simple or rarely irregularly compound and few-flowered. Ovary 2-celled.
- Carpels nearly terete or angular. Tufted perennials with radical or imbricate leaves, or rarely slender and creeping stems . . . 5. *AZORELLA*.
- Carpels much compressed dorsally. Tufted perennials with radical leaves and peduncles 6. *DIPLASPIS*.
- Umbels simple. Ovary and fruit of a single ovule and seed . . . 7. *ACTINOTUS*.
- Heads of flowers simple, dense. Leaf-lobes and involucral bracts rigid and pungent-pointed 8. *ERYNGIUM*.
- Fruit slightly or not compressed. Carpels with 5 prominent ribs and usually 1 vitta under each furrow.
- Umbels simple.
- Small creeping glabrous plant with linear tufted entire leaves. Albumen terete 11. *CRANTZIA*.
- Tufted pubescent perennial. Leaves much dissected. Albumen concave towards the commissure 14. *OREOMYRRHIS*.
- Umbels compound.
- Fruit-ribs obtuse.
- Commissure of the fruit narrow. Seeds terete 9. *APIUM*.
- Commissure of the fruit broad. Seeds semiterete 10. *SESELL*.
- Fruit-ribs very acutely prominent, the lateral ones often almost winged 12. *ACIPHYLLUM*.
- Fruit scarcely compressed, densely covered with bristles proceeding from 4 prominent secondary ribs on each carpel, with single vittæ under the ribs. Primary ribs inconspicuous 13. *DAUCUS*.
- Besides the above genera, the following *Umbellifera*, introduced from Europe, have more or less established themselves in some of the settled colonies, all with compound umbels.
- Petroselinum sativum*, Hoffm. (*Parsley*). An erect glabrous plant with dissected leaves, allied to *Apium*, but the umbels all pedunculate with a few involucral bracts, the flowers of a pale greenish-yellow, and the carpophore bipartite.—About Adelaide.
- Anni majus*, Linn. With dissected leaves, pedunculate umbels, the flowers and fruit nearly of *Apium*, but the general involucre of a few dissected bracts.—Paramatta, *Woolfs*.
- Sium latifolium*, Linn., and *S. angustifolium*, Linn. Perennials decumbent or sometimes creeping at the base, and erect or ascending stems. Leaves simply pinnate. Fruits nearly those of *Apium*, but the calyx-teeth usually prominent and several vittæ under each furrow. Umbels with general and partial involucres. *S. latifolium*, a large species with the umbels all terminal.—Cape Wilson and Loftly Range, F. Mueller. *S. angustifolium*, smaller, with the umbels leaf-opposed or lateral.—Paramatta, *Woolfs*.
- Pastinaca sativa*, Linn. (*Parsnip*). Erect with pinnate leaves. Umbels without involucres. Fruits dorsally compressed, very flat, oval, with scarcely prominent ribs and very conspicuous vittæ.—Near Adelaide, F. Mueller.
- Canealis infesta*, Curt. Erect, tall but slender, with pinnatifid or pinnate leaves. General involucre none or of one linear bract. Fruit small, bristly as in *Daucus*, but the bristles scattered, the secondary ribs not prominent, the primary ones alone conspicuous, with single vitta under the furrows.—Near Port Macquarrie in Tasmania, *Milligan*.
- Coriandrum sativum*, Linn. (*Coriander*). An erect rather slender annual with finely dissected leaves. Umbels without general involucre. Fruits globular, not readily separating into two carpels, and without vittæ.—Near Adelaide.

We have also from W. Australia, *Drummond*, 2nd Coll. n. 195, specimens in leaf only of



an *Umbellifer* which I have been unable to match precisely, although they much resemble the above-mentioned *Sium angustifolium*, Linn.

1. HYDROCOTYLE, Linn.

Calyx-teeth minute or inconspicuous. Petals entire, acute, valvate or imbricate. Disk flat, with a raised annular or cup-shaped margin. Fruit laterally compressed, without vittæ, often didymous, carpophore deciduous with the carpels or persistent; carpels with the dorsal rib prominent, the lateral ribs concealed in the commissure, or distinct and prominent or rarely combined in one prominent rib, the intermediate ribs usually prominent, straight, curved or short and semicircular; secondary ribs very rarely conspicuous. Seed straight, laterally compressed. Herbs either prostrate and rooting at the nodes or erect and annual. Leaves either orbicular, peltate or deeply cordate and entire or divided, or cuneate at the base and divided. Stipules scarious, often toothed or jagged, especially in the annual species. Flowers small, sometimes unisexual, in simple umbels or also verticillate on the peduncle below the terminal umbel, white or rarely purplish.

The genus is dispersed over the warmer and temperate regions of the globe, most frequent in moist situations or floating in water. Of the 26 Australian species two have a wide range over the New as well as the Old World, a third is also in New Zealand and perhaps in some other countries, the remainder are endemic.

SECTION I. *Euhydrocotyle*.—Leaves (except in *H. alata*) orbicular and peltate or deeply cordate, or divided to the base into 3, 5 or more segments. Petals valvate. Carpels with the intermediate ribs alone prominent on each side or rarely with the lateral ones also distinct and prominent.

Stems creeping and rooting, at least at the lower joints. Carpophore deciduous with the carpels.

Fruits more or less didymous, the carpels convex on the sides, the dorsal edge obtuse.

Leaves orbicular, peltately attached by the centre 1. *H. vulgaris*.

Leaves rounded or reniform-cordate with a deep sinus at the insertion of the petiole, crenate or lobed but not divided to the base.

Fruits nearly sessile in the head.

Small densely-matted plant. Stipules imbricated on the short flowering branches 2. *H. peduncularis*.

Diffuse plants with distinct flowering nodes. Stipules not imbricate 3. *H. hirta*

Fruits distinctly pedicellate in the umbel.

Flowering-stems ascending or erect. Leaves more or less hirsute and lobed. Fruit 1 line broad 4. *H. laxiflora*.

Flowering-stems slender and diffuse. Leaves glabrous, scarcely lobed. Fruit $\frac{3}{4}$ line broad on long slender pedicels 5. *H. pedicellosa*.

Leaves divided to the base into 3 or 5 lobes 6. *H. tripartita*.

Fruits flat, striate, the dorsal edge of the carpels acute, the secondary ribs slightly prominent. Plant glabrous 7. *H. plebeia*.

Fruits very flat, the dorsal edge of the carpels acute or winged. Plants usually glabrous.

Leaves rounded or reniform, crenate or broadly and obtusely lobed.

Carpels with the dorsal edge acute but not winged 7. *H. plebeia*.

Carpels with the dorsal edge expanded into a wing 8. *H. pterocarpa*.

- Leaves divided to the base or nearly so into lanceolate segments. Carpels not winged 9. *H. geraniifolia*.
- Small or filiform, erect or diffuse annuals, not rooting at the joints. Carpophore persistent or deciduous.
- Fruits broader than long, more or less didymous with 2 (intermediate) ribs on each side, the lateral ribs not distinct from the narrow commissure.
- Fruits with the ribs very prominent, forming 6 thick obtuse wings to the fruit, the intermediate ones not much curved . 10. *H. medicaginoïdes*.
- Fruits with the intermediate ribs semicircular, enclosing a pit or inner disk.
- Dorsal rib winged 11. *H. muriculata*.
- Fruit not winged.
- Fruit smooth or scarcely granular outside the rib.
- Leaves nearly divided to the base. Semicircular ribs of the fruit very obtuse, enclosing a small pit . . . 12. *H. callicarpa*.
- Leaves not divided to the middle. Semicircular ribs of the fruit acute, enclosing a broad disk . . . 13. *H. scutellifera*.
- Fruit granular or muricate along the ribs.
- Fruit about $\frac{1}{4}$ line broad 14. *H. hispidula*.
- Fruit nearly 1 line broad, very didymous 15. *H. trachycarpa*.
- Fruit transversely rugose, forming 1 or 2 rows of little pits outside the semicircular ribs.
- Pits several in 1 or 2 rows.
- Plant of 3 to 6 in., often hirsute. Fruit 1 line broad 16. *H. pilifera*.
- Plant of 1 to 2 in., glabrous. Fruit $\frac{3}{4}$ line broad . 17. *H. capillaris*.
- Pits 2, 3 or rarely 4 to each carpel 18. *H. rugulosa*.
- Fruits broader than long, very flat, with 4 or apparently 6 ribs on each side (the lateral ribs distinct from the commissure and the dorsal rib very thick, so as to be prominent on each side) . 19. *H. diantha*.
- Fruits ovate or not broader than long, striate with 4 nearly parallel ribs on each side (the lateral ones distinct from the commissure).
- Leaves orbicular-cordate or reniform.
- Stems long and slender. Umbels 6- to 10-flowered . . 20. *H. grammatocarpa*.
- Stems floating, leafy part very short. Umbels 3- to 6-flowered 21. *H. lemnoïdes*.
- Leaves triangular hastate or acutely 5-lobed. Stems erect or shortly diffuse 22. *H. alata*.
- Fruits acutely tetragonous (the lateral ribs forming one prominent angle at the broad commissure, the dorsal rib prominent, the intermediate ones inconspicuous) 23. *H. tetragonocarpa*.
- SECTION II. **Gentella**.—Leaves (except in *H. asiatica*) cuneate at the base or narrow. Petals imbricate.
- Small annuals. Leaves cuneate at the base, toothed or 3-partite.
- Leaves deeply toothed. Flowers in dense heads. Fruits didymous, glochidiate. Plant of 1 to $1\frac{1}{2}$ in. 24. *H. glochidiata*.
- Leaves lobed or partite. Flowers in loose umbels. Fruits very flat. Plant of 2 to 6 in. 25. *H. verticillata*.
- Perennial, creeping and rooting at the nodes. Leaves broadly cordate. Carpophore deciduous with the fruit. Fruits obscurely several-ribbed (the secondary ribs sometimes conspicuous) . . 26. *H. asiatica*.
- (*Azorella Muelleri* has the habit and stipules of a *Hydrocotyle*, but the fruit is scarcely compressed, furrowed at the commissure, and the calyx-teeth very prominent.)

SECTION 1. ECHYDROCOTYLE, DC.—Leaves (except in *H. alata*) orbicular and pettate or deeply cordate, or divided to the base into 5 or more segments. Petals valvate. Carpels with the intermediate ribs alone prominent on each side, or rarely with the lateral ones also distinct and prominent.

1. **H. vulgaris**, Linn.; DC. Prod. iv. 59. Stems slender, creeping in mud or floating in water, rooting at every node and emitting from the same point tufts of leaves and peduncles. Leaves orbicular, $\frac{1}{2}$ to 1 in. diameter or when very luxuriant twice that size, crenate or slightly lobed, pettately attached by the centre to a rather long petiole, with about 9 or when luxuriant 11 nerves radiating from the same point. Stipules broad and entire but very soon worn away from the rooting nodes. Peduncles shorter than the petioles, either with a single terminal head or umbel or with the addition of 2 or 3 whorls below it of minute white flowers on exceedingly short pedicels. Bracts small, scarious. Petals valvate, slightly induplicate. Fruit $1\frac{1}{4}$ to $1\frac{1}{2}$ lines broad, not above 1 line long, 2-ribbed on each side (the intermediate ribs alone prominent, the lateral ones concealed in the commissure), the dorsal edge of the carpels obtuse.—Reichb. Ic. Fl. Germ. t. 1842; *H. interrupta*, Muehl.; DC. Prod. iv. 59; *H. verticillata*, Thunb.; Harv. and Sond. Fl. Cap. ii. 527.

Queensland. Moreton Bay, *Leichhardt*.

N. S. Wales. Paramatta, *Woolfs*; Hunter's River, *Oldfield*.

Victoria. Lake Wellington, Gipps' Land, and Murray river, *F. Mueller*; near Melbourne, *Adamson*.

S. Australia. St. Vincent's Gulf, Gawler river, *F. Mueller*.

The species is widely distributed over the temperate regions of both hemispheres.

2. **H. peduncularis**, R. Br. in A. Rich. Hydroc. 62. t. 61. f. 26. Stems perennial and creeping to some length, with numerous very short flowering branches covered with imbricate stipules, forming usually little densely branched tufts. Leaves orbicular-cordate or reniform, rarely above 2 lines diameter, shortly broadly and obtusely 5-lobed. Peduncles filiform, usually but not always exceeding the leaves, bearing a head of 3 to 6 small flowers. Petals valvate. Fruits about $\frac{3}{4}$ line broad, carpels with convex sides, each with a prominent curved rib. Styles short.—DC. Prod. iv. 66; Hook. f. Fl. Tasm. i. 152. t. 32B.

Tasmania. Marshes at Circular Head, summits of the Western Mountains, Hampshire Hills, etc., *J. D. Hooker* and others.

Var. *gracilentia*, Hook. f. More slender and lax.—*H. gracilentia*, Hook. f. in Hook. Lond. Journ. vi. 467. This is much like the most slender and smallest forms of *H. hirta*, but the stipules are much larger, the habit different, the flowers much fewer, the ribs of the fruit more curved and prominent.

3. **H. hirta**, R. Br. in A. Rich. Hydroc. 64. Prostrate or creeping and rooting at least at the lower nodes, rather slender and more or less hirsute. Leaves orbicular-cordate or reniform, divided to about $\frac{1}{4}$ or $\frac{3}{4}$, rarely deeper, into about 7 broad crenate lobes, usually from $\frac{1}{2}$ to $1\frac{1}{2}$ in. diameter. Stipules usually ciliate or fringed. Peduncles solitary or 2 together, each with a small head of numerous (10 to 40) minute flowers, sessile or very shortly pedicellate. Bracts small. Petals valvate. Fruits not more than 1 line diameter and often smaller, very closely packed in a small globular head.

quite smooth or granular, each with 2 prominent ribs on each side (the intermediate ones), the dorsal edge of the carpels obtuse.—Hook. f. Fl. Tasm. i. 152.

Queensland. Brisbane river, *F. Mueller*.

N. S. Wales. Port Jackson, *R. Brown*, and others.

Victoria. From Gipps' Land to the western frontiers, *F. Mueller*, and others.

Tasmania. Port Dalrymple, *R. Brown*; abundant in wet places throughout the colony, *J. D. Hooker*.

S. Australia, *R. Brown*, Lofty Range, Mount Disappointment, etc., *F. Mueller*.

W. Australia, *Drummond*, 3rd Coll. Suppl. n. 32.

Var. (?) *acutifolia*, *F. Muell*. Leaves divided to about the middle into triangular more or less acute lobes. Plant rather large. Fruits very small.—Queensland, from Dawson river, *F. Mueller*, Rockhampton, *Dalochy*, to Brisbane river, Moreton Bay, *F. Mueller*, and others.

Var. ? *pusilla*. Smaller and less hirsute, sometimes nearly glabrous. *H. pulchella*, *R. Br.* in *A. Rich. Hydroc.* 59; *DC. Prod.* iv. 66; *H. elegans*, *A. Rich. Hydroc.* 58; *DC. Prod.* iv. 66 (with deeper lobed leaves); *H. lasiocarpa*, Hook. f. in Hook. Lond. Journ. vi. 467, and Fl. Tasm. i. 152. t. 32A; *H. vagans*, Hook. f. in Hook. Lond. Journ. vi. 468, and Fl. Tasm. i. 153. t. 33A.—From Queensland to Tasmania, including some of Sieber's specimens, n. 14. The more glabrous forms from more aquatic situations.

The species may not be distinct from a common tropical and subtropical one, which includes *H. rotundifolia*, *Roxb.*; *Wight*, Ic. t. 564, from tropical Asia; *H. sidthorpioides*, *Lam.*; *A. Rich. Hydroc.* t. 54. f. 8. from the Mauritius; *H. Mannii*, Hook. f. in Journ. Linn. Soc. vii. 194, from tropical Africa; *H. marchantioides*, *Clos* in *Gay*, Fl. Chil. iii. 67, from Chile, and some forms usually referred to *H. Bonplandi*, *A. Rich.* from the Andes. The common New Zealand *H. marschala*, *Forst.*, is rather more distinct, but even that might perhaps be included in the same series, and, if so, *Forster's* name appears to have the right of priority for the collective species.

H. intertexta, *R. Br.*; *A. Rich. Hydroc.* 63; *DC. Prod.* iv. 66, from the single small specimen I have seen, would appear to be one of the forms of *H. hirta*, with rather longer styles. *A. Richard* describes the calyophore as persistent, a character which the specimen I saw did not show. *H. Gaudichaudiana*, *DC. Prod.* iv. 67, only known to me by the diagnosis given, is again probably one of the forms of *H. hirta*.

4. ***H. laxiflora***, *DC. Prod.* iv. 61. Stems creeping and rooting like the allied species, but the flowering branches often ascending or erect to the length of 6 in. or even more, hirsute as well as the leaves with spreading hairs. Leaves orbicular-cordate, shortly and broadly 5- to 11-lobed and crenate, rarely above 1 in. diameter. Stipules entire or slightly fringed-ciliate. Peduncles short or long, each with a globular umbel of 30 to 40 or even more flowers. Bracts numerous, small and narrow. Pedicels varying from $\frac{1}{2}$ line to 3 lines long, when long usually with infertile flowers. Petals valvate. Styles long. Fruit about 1 line broad or rather more, smooth or granular, with 2 prominent ribs (the intermediate ones) on each side, the dorsal edge of the carpels obtuse.—*F. Muell. Fragm.* iv. 179; *H. densiflora*, *DC. Prod.* iv. 67; *F. Muell. Fragm.* iv. 180.

Queensland. Dawson and Burnett rivers, *F. Mueller*.

N. S. Wales. Blue Mountains and in the interior to Bathurst and Argyle county, *A. Cunningham*, *Woolfs*, and others; New England, *Beckler*.

Victoria. Port Phillip, *Gunn*; Glenelg river, *Allitt*.

S. Australia. Torrens river, St. Vincent's Gulf, etc., *Behr*, *F. Mueller*.

Var. ? *minor*. Flowers and fruits very much smaller.—Moreton Bay, *C. Stuart*.

De Candolle had already observed the great similarity between his *H. laxiflora* and *H. densiflora*, which appear to be always found growing together, and *F. Mueller*, *Fragm.* iv. 180.

seems to have suspected dimorphism. An observation of numerous specimens seems to show that the differences are those of semisexual dimorphism. In the large-pedicelled umbels the petals are more expanded, the stamens longer, and the ovary enlarges but little, and ultimately withers without forming good seed. I have only found ripe fruits in the dense umbels, in which the pedicels rarely attain 1 line. In these the petals open less freely, sometimes adhering till they fall, and the stamens are shorter. I have found both kinds of umbels on the same specimen.

5. *H. pedicellosa*, *P. Muell. Fragm.* iv. 182. Stems slender, slightly pubescent or nearly glabrous. Leaves orbicular-cordate or reniform, crenate, scarcely lobed, thin, glabrous or sparingly pubescent, often above 1 in. diameter. Stipules broad, entire. Peduncles filiform, with a loose umbel of 10 to 30 very small flowers, on filiform pedicels varying from 1 to 3 lines in length. Bracts all broad, short, and scarious. Ovary at the time of flowering not $\frac{1}{4}$ line long and broad. Petals valvate, glandular. Styles rather long. Fruits about $\frac{3}{4}$ line broad, smooth or granular, with 2 scarcely prominent ribs on each side.

N. S. Wales. Richmond river, *Beckler*.—The species requires further investigation. Some of the apparent characters may be due to the circumstances under which the specimens were growing.

6. *H. tripartita*, *R. Br. in A. Rich. Hydroc.* 69, t. 61, f. 25. Small and very slender, sometimes densely matted, or the filiform stems extending to several in., glabrous or sprinkled with a few hairs. Leaves divided to the petiole into 3 to 5 cuneate entire or 2- or 3-toothed segments, rarely above 3 lines long, and sometimes not $1\frac{1}{2}$ lines. Stipules entire. Peduncles filiform, shorter than the leaves, each with an umbel or head of 3 to 6 or rarely more small flowers nearly sessile. Fruits $\frac{3}{4}$ line diameter, with 2 slightly prominent ribs on each side, smooth or granular; carpels convex on the sides, the dorsal edge obtuse.—*DC. Prod.* iv. 65.

Queensland. Burnett river, *F. Mueller*.

N. S. Wales. Port Jackson, *R. Brown, Sieber*, n. 411 (partly), *Woolfs*.

Var. *muscosa*. Very small and densely matted; stems often under 1 in. long; leaves not above $\frac{1}{4}$ in. diameter.—*H. muscosa*, *R. Br. in A. Rich. Hydroc.* 68, t. 61, f. 27; *DC. Prod.* iv. 64; *Hook. f. Fl. Tasm.* i. 154.

Victoria. Broken River, *F. Mueller*.

Tasmania, *R. Brown*; Circular Head, forming large patches in moist places, *Green*.

7. *H. plebeia*, *R. Br. in A. Rich. Monogr.* 16, t. 60, f. 23. A rather large species, creeping and rooting at the lower nodes, quite glabrous. Leaves orbicular-cordate or reniform, crenate or shortly 9- to 11-lobed, $\frac{1}{2}$ to 1 or even 2 in. diameter, the sinus deep and narrow. Stipules broad, entire. Peduncles filiform, with a small globular head of numerous minute almost sessile flowers. Bracts small, narrow. Petals valvate. Fruits about 1 line diameter, very flat, with 2 prominent ribs on each side, carpels much compressed laterally, with the dorsal edge acute but not winged.

W. Australia. King George's Sound, *R. Brown*; also *Irwinia*, *2nd Coll.* n. 196.

The species is allied to *H. americana*, *Linn.*, which, however, has the fruit much smaller and not so flat, connecting the species with the larger forms of *H. hirta*.

H. striata, *Benth. in Huac. Enum.* 53, was described from a small specimen which I now think is a variety of *H. plebeia*, in which the lateral ribs of the carpels are slightly prominent between the primary ones, giving the whole fruit a striate appearance.

8. **H. pterocarpa**, *F. Muell. in Trans. Vict. Inst.* 1855, 126, and in *Hook. Kew Journ.* viii. 69. Very near *H. plebeia*, differing only in the winged fruits, glabrous, creeping, and rooting at the base. Leaves orbicular-cordate or reniform, doubly crenate or obscurely lobed, about $\frac{1}{2}$ to 1 in. diameter, on long petioles. Stipules entire. Peduncles shorter than the petioles, with a small globular head of rather numerous flowers almost sessile. Bracts small. Petals valvate. Fruits rather broader than long, notched above and below, very flat, with 2 prominent ribs on each side, attaining sometimes fully 2 lines diameter, the acute dorsal edge of the carpels being expanded into a wing. — *Hook. f. Fl. Tasm.* i. 159. t. 33.

Victoria. Rivulets towards Mount Disappointment, *F. Mueller*; Glenelg river, *Robertson*.

Tasmania. Formosa, *Gunn*; South Port, *C. Stuart*.

The species is also in New Zealand. The dilatation of the fruit appears to be somewhat variable, and it is possible that it may prove to be a variety of *H. plebeia*.

9. **H. geraniifolia**, *F. Muell. in Trans. Vict. Inst.* 1855, 126, and in *Hook. Kew Journ.* viii. 70; *Fragm.* iv. 181. Glabrous or rarely sprinkled with a few hairs; stems lax, diffuse, often rooting at the lower joints, 1 to 2 ft. long or more. Leaves deeply divided into 3 to 7 lanceolate-acute toothed or lobed segments, the larger central one often above 1 in. long; the lower leaves sometimes slightly peltate. Stipules fringed. Peduncles slender, with an umbel of rather numerous flowers, on short filiform pedicels. Bracts minute, except two larger scarious very deciduous outer ones. Petals valvate. Fruits nearly 2 lines broad, very flat, deeply notched at the base, the dorsal edge of the carpels acute and expanded into a narrow wing, with 2 (intermediate) prominent ribs on each side, short and semicircular, the cavity inside smooth or with one row of granules, the carpels outside the rib more or less granular-tuberculate.

N. S. Wales. Port Jackson, *R. Brown*; Blue Mountains, *Miss Atkinson*; Hastings and Macleay rivers, *Beckler*.

Victoria. Moist valleys, from the Dandenong range to Gipps' Land, *F. Mueller*.

When large and luxuriant, the species bears some outward resemblance to the Peruvian *H. quinquefolia*, Ruiz and Pav., but the fruit is quite different. In the latter respect as well as in the habit it comes near to *Trachymene procumbens*, but is at once known by the stipules and minute scarious bracts.

10. **H. medicaginoides**, *Turez. in Bull. Mosc.* 1849, ii. 27. A little slender annual of $\frac{1}{2}$ to 3 in., glabrous or sprinkled with a few white hairs. Leaves few, small, petiolate, orbicular-cordate, divided very deeply or quite to the base into 3 entire or 2- or 3-lobed segments. Stipules fringed-ciliate. Peduncles filiform, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, with 6 to 12 minute flowers, almost sessile in a head scarcely $\frac{1}{2}$ line diameter. Petals valvate. Fruits nearly sessile, $\frac{3}{4}$ line broad and about half as long, the intermediate ribs on each side and the dorsal edge very prominent, forming 3 thick wings to each carpel, and very rugose between them. — *H. lobocarpa*, *F. Muell. Fragn.* iv. 178.

Victoria. Towards Lake Hindmarsh, *Dallachy*.

W. Australia. *Drummond*, 4th Coll. n. 144.

11. **H. muriculata**, *Turez. in Bull. Mosc.* 1849, ii. 28. A little glabrous annual of 1 to 2 in. Leaves deeply 3- or 5-lobed. Stipules

fringed-ciliate. Peduncles filiform, longer than the leaves, but not exceeding 4 lines, bearing each a little head of rather numerous minute flowers. Petals acute, valvate, thin and rather larger than in the allied species. Fruit very flat, $1\frac{1}{2}$ lines broad, and much shorter, the dorsal edges of the carpels expanded into a rather broad thin wing, the intermediate ribs raised with a row of tubercles on each side. Carpophore apparently persistent.

W. Australia, Drummond, 4th Coll. n. 143.

12. **H. callicarpa**, Bunge in *Pl. Preiss.* i. 283. A little annual with a tuft of procumbent or ascending stems of 1 to 3 in., usually glabrous. Leaves $\frac{1}{4}$ to $\frac{1}{2}$ in. diameter, the lower ones sometimes lobed only, but mostly divided into 3 to 5 broadly cuneate toothed or lobed segments, glabrous or sprinkled with a few hairs. Stipules often fringed or jagged. Umbels sessile or pedunculate, each with about 6 to 10 minute flowers, on slender pedicels rarely above $\frac{1}{2}$ line long. Petals valvate. Fruits $\frac{1}{2}$ to $\frac{3}{4}$ line broad, didymous, smooth, not winged, the intermediate ribs obtusely prominent, semicircular, enclosing a well-defined pit. Carpophore usually persistent.—*H. tripartita*, Hook. f. in Hook. Ic. Pl. t. 312, and Fl. Tasm. i. 153, not of R. Br.

Victoria. Yarra-Yarra and Port Phillip, *F. Mueller*; Creswick, Skipton, etc., *Whan*; Glenelg river, *Robertson*.

Tasmania. Near Launceston, *Gunn* and others.

S. Australia. Murray river, Lofly and Barossa ranges, St. Vincent's Gulf, *F. Mueller*.

W. Australia. King George's Sound, *Preiss*, n. 2074; Swan River, *Drummond*, n. 5.

13. **H. scutellifera**, Benth. A diffuse glabrous annual of 2 to 4 in. Leaves orbicular-cordate or reniform, with 3, 5, or 7 broad obtuse lobes, entire or crenate, not reaching to the middle. Stipules broad, jagged. Peduncles usually exceeding the leaves, bearing a globular head or umbel of 10 to 20 very small flowers, sessile or nearly so. Petals valvate. Styles very short. Fruits about $\frac{3}{4}$ line broad, $\frac{1}{2}$ line long, very flat, the dorsal edge of the carpels rather thick, the surface smooth, the intermediate ribs acutely prominent, semicircular, enclosing a little shield on each side of the fruit. Carpophore usually deciduous with the carpels.

W. Australia. Swan River, *Drummond*, 1st Coll. and 2nd Coll. n. 4.

14. **H. hispidula**, Bunge in *Pl. Preiss.* i. 283. A slender annual of 3 to 6 in., usually glabrous. Leaves orbicular-cordate, rather deeply divided into 5 broad lobes again toothed or lobed, more or less hispid on both sides, the radical leaves about $\frac{1}{2}$ in. diameter on long petioles, the stem leaves few and small. Stipules fringed or jagged. Flowers exceedingly small, 6 to 12 in the umbels or heads, the pedicels scarcely attaining $\frac{1}{2}$ line when in fruit. Petals valvate. Fruits $\frac{1}{2}$ line broad and not so long, didymous, the intermediate ribs semicircular, obtusely prominent, and slightly granular-tuberculate. Carpophore short, persistent.

W. Australia. Sands of Rottenest Island, *Preiss*, n. 2086.

Var. *tenella*. More slender and diffuse. Leaves less lobed, on shorter petioles. -Warren river, *Herb. F. Mueller*.

15. **H. trachycarpa**, *F. Muell.* in *Linnaea*, xxv. 394. A glabrous

annual, with very slender diffuse stems, elongated but not rooting at the joints. Leaves divided to below the middle into 5 or 3 broadly cuneate lobes, each with 2 or 3 deep teeth or lobes, the larger ones above $\frac{1}{2}$ in. diameter, all very thin. Stipules minute, slightly ciliate. Peduncles filiform, each with an umbel of 3 to 6 very minute flowers. Pedicels at first very short, at length nearly as long as the fruit. Petals valvate. Fruit nearly 1 line broad, but not nearly so long, didymous, the intermediate ribs semicircular, obtusely prominent, usually with a few tubercles in the enclosed pit, and a single row on the outside. Carpophore short, persistent.

N. S. Wales. Darling river, *Victorian Expedition*.—Perhaps a variety only of *H. hispidula*.

16. **H. pilifera**, *Turez. in Bull. Mosc.* 1849, ii. 26. An erect annual, often coarser than the allied species, and attaining 6 in. to 1 ft., although sometimes small, more or less hirsute with spreading hairs or rarely quite glabrous. Leaves $\frac{1}{2}$ in. diameter or more, deeply divided into about 5 cuneate lobes, usually again toothed or lobed. Stipules scarious, but more adnate to the petiole than in most species. Umbels pedunculate, with about 10 to 20 minute flowers on very short pedicels. Petals valvate. Fruits about 1 line broad, didymous, the intermediate ribs semicircular, obtusely prominent, the enclosed pit smooth, with numerous transverse reticulations outside. Carpophore persistent.

W. Australia, *Drummond, 1st Coll. (2nd Coll.?)* n. 21 and 198; Pinjarra, Murray river, *Oldfield*.

Var. *glabrata*. Nearly or quite glabrous. Swan River, *Drummond, 1st Coll.*

17. **H. capillaris**, *F. Muell. Fragm.* iv. 178. A minute slender glabrous annual, rarely exceeding 2 in., and often under 1 in. Leaves very small, deeply divided into 3 lobes or segments, obtuse and entire, or shortly 2- or 3-lobed. Stipules broad. Peduncles short, with a head or umbel of 3 to 6 minute flowers on very short pedicels. Petals valvate. Fruits about $\frac{3}{4}$ line broad, didymous, the intermediate ribs semicircular, very prominent, the enclosed pit smooth, the outside remarkably pitted and rugose.

Victoria. Muddy places often dried up, Port Phillip, Wopkins river, *F. Mueller*.

S. Australia. Mount Gambier and Kangaroo Island, *F. Mueller*.

W. Australia. Geographe Bay, *Oldfield*.

The species differs from *H. pilifera*, var. *glabrata*, chiefly in its minute size and smaller less-divided leaves.

18. **H. rugulosa**, *Turez. in Bull. Mosc.* 1849, ii. 27. A small slender glabrous annual, with erect or diffuse stems of 2 to 4 in. Leaves not above $\frac{1}{2}$ in. diameter, divided to the base into 3 to 5 broadly-cuneate toothed or lobed segments. Stipules broad, slightly jagged. Peduncles short, slender, with an umbel of 2 to 4 minute flowers, on very short pedicels. Petals valvate. Fruits $\frac{1}{2}$ to $\frac{3}{4}$ line broad, didymous, the intermediate ribs very prominent, semicircular, connected with the outer margin by 2 or 3 raised transverse lines, thus forming 1 or rarely 2 pits within the rib, and 3 or 4 outside of it.

W. Australia, *Drummond, 4th Coll.* n. 146.

19. **H. grammatocarpa**, *F. Muell. Fragm.* ii. 128. A glabrous

annual with filiform stems, diffuse or prostrate, and often elongate but not rooting at the nodes. Leaves cordate-orbicular or reniform, often above $\frac{1}{2}$ in. diameter, crenate or obscurely 5- or 7-lobed, very thin and membranous. Stipules fringed. Peduncles filiform, with a globular head or umbel of 6 to 10 or rather more minute flowers, at first nearly sessile, at length shortly pedicellate. Petals thin, coloured, but acute and valvate. Fruits broadly ovate, about $\frac{1}{4}$ line broad and rather longer, slightly compressed, not indented at the commissure, with about 6 equal ribs on each side (the secondary ones prominent). Carpophore deciduous with the carpels.

N. Australia. Gulf of Carpentaria, *F. Mueller*.

20. **H. diantha**, *DC. Prod.* iv. 63. A very slender diffuse glabrous annual, from 1 or 2 in. to twice that length. Leaves shortly petiolate, orbicular-crenate or reniform, shortly and obtusely 4- or 7-lobed. Stipules broad, entire. Umbels sessile or shortly pedunculate with 3 to 6 or rarely only 2 pedicellate flowers. Petals acute, valvate. Styles exceedingly short. Fruits on pedicels of $\frac{1}{2}$ to 1 line, very flat, fully 1 line broad and not so long; at first appearing 4-ribbed on each side, when quite ripe the dorsal rib thickens so as to appear almost double, and each carpel is semiorbicular, very flat, each side bordered by a thick margin with the intermediate rib not so prominent.—*F. Muell. Fragm.* iv. 179.

W. Australia. Swan River, *Huegel*; Blackwood and Tone rivers, *Oldfield*.

21. **H. lemnoïdes**, *Benth.* A very small Lemna-like plant evidently floating in water, with long matted filiform roots or submerged stems, the leaf-bearing part not above $\frac{1}{2}$ in., and often not $\frac{1}{4}$ in. long. Leaves petiolate, orbicular-cordate or reniform, obscurely crenate, 1 to 2 lines diameter. Stipules broad and rather large. Flowers apparently unisexual, in umbels of 3 to 6. Male umbels nearly sessile. Petals rather thick, valvate. Styles present, but the ovary abortive. Females (only seen in fruit) shortly pedunculate. Fruits about $\frac{1}{2}$ line broad and long, notched at the base, laterally compressed, the carpels convex and faintly nerved on each side.

W. Australia, *Drummond*, n. 202.

22. **H. alata**, *R. Br. in A. Rich. Hydroc.* 73. t. 61. f. 28. A little erect glabrous annual of 1 to 2 in., with slender divaricate branches. Leaves shortly petiolate, triangular-hastate and deeply 3-lobed, rather thick, not above 2 lines broad in our specimens. Stipules small, scarious. Peduncles 1 to 2 lines long, with a head or umbel of 6 to 12 almost sessile flowers. Petals not seen. Fruits about $\frac{3}{4}$ lines long and broad, compressed, with 4 to 6 nearly equal ribs on each side, otherwise smooth or minutely rugose.—*H. cymbalaria*, *Benth. in Hueg. Enum.* 53.

W. Australia. King George's Sound, *R. Brown, Huegel*; Tweed and Kalga rivers, *Oldfield*.

23. **H. tetragonocarpa**, *Bunge, in Pl. Preiss.* i. 284. A slender diffuse glabrous annual, from 1 or 2 in. to $\frac{1}{2}$ ft. long or rather more. Leaves cordate-orbicular or reniform, shortly and broadly 5- or 7-lobed, the lobes entire or slightly toothed, the lower ones rarely slightly peltate. Stipules broad, mostly jagged. Peduncles filiform, mostly shorter than the leaves,

each with about 6 to 10 very small almost sessile flowers. Petals valvate. Fruits about $\frac{3}{4}$ line long, not compressed, acutely 4-angled with 2 styles, or very rarely 3-angled with 3 styles, obscurely striate, but not seen quite ripe.

W. Australia. Wet sands, Rottenest Island, *Preiss*, n. 2085; wet places, Swan River, *Oldfield*.

I have not succeeded in finding either in *Preiss*'s or in *Oldfield*'s specimens perfectly ripe fruit with good seed, but those that have apparently attained their full size are remarkable for the acutely-prominent lateral angles of the carpels, the commissure as broad as the opposite diameter of the fruit; it is probable, however, that when quite ripe the dorsal edge of the carpels may be more dilated.

SECTION II. CENTELLA.—Leaves (except in *H. asiatica*) cuneate at the base or narrow. Petals imbricate.

24. **H. glochidiata**, *Benth.* A little erect or diffuse branching annual, $\frac{1}{2}$ to $1\frac{1}{2}$ in. high, the stem and leaves rather thick for the size. Leaves few, obovate or cuneate, with 2 or 3 coarse teeth or lobes. Stipules broad, entire. Flowers numerous, sessile in dense globular or ovoid heads of 1 to 2 lines. Bracts linear-spathulate. Calyx-teeth inconspicuous. Petals broad obtuse, slightly imbricate. Styles very short. Fruits about $\frac{1}{2}$ line broad and long, didymous, hispid with short glochidiate bristles, the intermediate and dorsal ribs very prominent, the commissure very narrow. Carpophore not persistent.

W. Australia. *Drummond*, n. 104 (105?) and 4th Coll. n. 247.

25. **H. verticillata**, *Turez. in Bull. Mosc.* 1849. ii. 28. An erect or diffuse glabrous annual, from 2 or 3 in. to twice that height. Leaves with a cuneate base tapering into the petiole, deeply divided into 3 cuneate lobes or segments which are again usually acutely 2- or 3-lobed. Stipules very minute or none. Umbels sessile, 6- to 12-flowered, the setaceous or almost spatulate bracts very minute or inconspicuous. Petals minute, broad, obtuse, slightly imbricate in the bud. Stamens and styles very short. Fruits on pedicels of about 1 line, very flat, about 1 line broad and not quite so long, smooth, the lateral ribs concealed in the narrow commissure, the intermediate ribs curved and very near the dorsal edge of the carpels. Carpophore persistent, more or less deeply divided, or rarely remaining entire.—*H. homalocarpa*, *F. Muell. Fragm.* ii. 129.

W. Australia. King George's Sound, *R. Br.*; Swan River, *Drummond*, 1st Coll. also 4th Coll. n. 145; wet places, Tweed, Murray and Blackwood rivers and Mount Barker, *Oldfield*.

This is a very anomalous species, differing from the other *Centellas*, and, indeed, from the whole genus, in its narrow dissected leaves and usually split carpophore. The fruit is otherwise quite that of *Euhydrocotyle*.

26. **H. asiatica**, *Lim.*; *DC. Prod.* iv. 62. A creeping perennial, rooting at the nodes, and sometimes half-floating. Leaves broadly cordate, orbicular or almost reniform, entire crenate or sinuate toothed, 1 to $1\frac{1}{2}$ in. diameter, glabrous or pubescent, on petioles varying very much in length. Stipules broad, usually entire. Flowers 3 or 4 in little heads or umbels, on peduncles varying much in length or almost sessile. Two outer bracts under the umbel broad and scarious like the stipules, the inner ones small and narrow. Petals broad and thin, much imbricated in the bud. Fruit nearly 2 lines diameter, laterally compressed, but the dorsal edges obtuse,

showing when young the secondary as well as the primary ribs, when ripe obscurely 4- to 6-ribbed on each side and somewhat reticulate.—Bunge in Pl. Preiss. i. 285; Hook. f. Fl. Tasm. i. 152; Wight, Ic. t. 565; *H. repanda*, Pers.; DC. Prod. iv. 62; *H. cordifolia*, Hook. f. in Hook. Ic. t. 303.

Queensland. Burdekin river, *F. Mueller*; Moreton Bay, *C. Stuart*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, n. 531, and others.

Victoria. Yarra and Ovens rivers, etc., *F. Mueller*.

Tasmania. Marshes, Arthur's Lake, Circular Head, Launceston, *J. D. Hooker*.

S. Australia. S. coast, *R. Brown*; Torrens river, *F. Mueller*.

W. Australia. Swan River, *Preiss*, n. 2065; also *Drummond*, *Ath Coll.* n. 147; Murchison river, *Oldfield*.

The species is also in New Zealand, and generally distributed over tropical and subtropical Asia, Africa, and America.

2. TRACHYMENE, Rudge.

(*Didiscus*, DC.; *Dimetopia*, DC.; *Pitzelia*, Walp.; *Huegelia*, Reich.; *Cesatia*, Endl.; *Hemicarpus*, *F. Muell.*)

Calyx-teeth minute or inconspicuous or rarely 1 or 2 rather longer and subulate. Petals entire, obtuse or nearly so, much imbricate. Disk flat or with slightly prominent margins or scarcely any. Fruit laterally compressed, usually flat, notched at the base, without vittæ; carpophore persistent, undivided; carpels laterally compressed, the dorsal rib prominent, rarely winged, lateral ones concealed in the narrow commissure, intermediate ribs semicircular, shorter than the fruit, enclosing as it were an inner disk. Seed straight, laterally compressed.—Herbs either annual, biennial or with a perennial stock, more or less hirsute or rarely glabrous. Leaves ternately divided or rarely toothed only, without stipules. Flowers white or blue, in simple umbels, on terminal or leaf-opposed peduncles. Involucre of linear bracts usually shortly united at the base. Fruits usually tubercular muricate or villous, one carpel often differently or less muricate than the other or abortive.

Besides the Australian species which are endemic, there is one from New Caledonia and one from Borneo.

Small annuals. Leaves divided. Flowers few in the umbels.

Fruits tubercular or muricate, one carpel differently or less so than the other, rarely both equally so or one quite smooth. 1. *T. pilosa*.

Fruits equally covered with long ciliate bristles 2. *T. cyanopetala*.

Fruits densely covered with a white cottony or spongy wool 3. *T. eriocarpa*.

Coarse erect annuals or biennials. Leaves divided or lobed. Flowers numerous in the umbel.

One carpel winged, the other usually abortive 4. *T. villosa*.

Fruit not winged.

Involucral bracts about as long as the pedicels. Flowers rather large. Carpels both perfect 5. *T. cœrulea*.

Involucral bracts much shorter than the pedicels. Flowers small.

Leaves divided. Carpels both perfect or one abortive.

More or less hirsute, not glaucous 6. *T. australis*.

Very glabrous and glaucous 7. *T. glaucifolia*.

Involucral bracts short. Leaves deeply 3-lobed, with oblong-cuneate lobes. One carpel abortive 8. *T. glandulosa*.

Rootstock perennial, with elongated branching stems.

Leaves deeply divided, both carpels usually perfect.

Stems erect, rigid. Leaves mostly radical from the base . . . 9. *T. incisa*.

Stems weak, procumbent, leafy . . . 10. *T. procumbens*.

Leaves toothed or lobed, mostly from the base of the stem. One carpel abortive . . . 11. *T. homocarpa*.

Stock perennial, densely tufted, bearing toothed or lobed leaves and simple peduncles. Both carpels usually perfect . . . 12. *T. humilis*.

1. ***T. pilosa*, Sm. in Rees Cycl. Suppl.** An erect or diffuse annual, rarely above 6 in. high and usually only 3 or 4 in., more or less hirsute or nearly glabrous. Leaves shortly petiolate, deeply 3- or almost 5-lobed, with linear or cuneate entire or 3-lobed divisions. Peduncles terminal or leaf-opposed, bearing each a small umbel of about 8 to 12 flowers on very short pedicels. Bracts 6 to 10, nearly as long as the flowers, slightly united at the base. Margins of the disk prominent. Fruits $1\frac{1}{2}$ to 3 times broad, the carpels usually unequally mucronate, one with acute or shortly aristate points, the other with obtuse tubercles or quite smooth.—*Dimetopia pusilla*, DC. Prod. iv. 71; *D. hirta*, Benth. in Hueg. Enum. 54; Bunge in Pl. Preiss. i. 284; *D. Walpersii*, Bunge, Del. Sem. Hort. Dorp. 1846, in Linnaea, xxiv. 156; *D. homocarpa*, Bunge in Bot. Zeit. 1847, 136; *D. isocarpa*, Bartl. according to Walp. Rep. v. 840; *Pritzelia didiscoides*, Walp. Rep. ii. 428.

N. S. Wales. Port Jackson, N. shore, *C. Moore*.

Victoria. Murray desert, *F. Mueller*.

S. Australia. Pine forest, *Behr*; near Adelaide, *F. Mueller*; Port Lincoln, *Wihelmi*.

W. Australia. King George's Sound, *R. Brown*, and adjoining districts, *Huegel*, *Oldfield*, and others; thence to Swan River, *Preiss*, n. 2072, *Oldfield*, and Champion Bay, *Walcott*, and eastward to Cape Arid, *Maxwell*.

Var. *Irreissiana*. Radical leaves larger, forming a dense tuft and exceeding the short stems. Involucral bracts rather longer.—*Dimetopia Preissii*, Bunge in Pl. Preiss. i. 284. Sandy banks of the lake in Rottnest island, *Preiss*, n. 2080, also *Drummond*, n. 32.

2. ***T. cyanopetala*, Benth.** Usually more slender and rather taller than *T. pusilla*, and glabrous or nearly so. Leaves as in that species, deeply 3- or 5-lobed, with linear or cuneate entire or 2- or 3-lobed divisions. Peduncles short. Involucre of 4 or 5 bracts, rather broader than in *T. pusilla*. Flowers in the umbel 3 to 6, on very short pedicels. Petals blue. Fruits densely covered with soft ciliate bristles, much longer than those of *T. pusilla* and usually equally dense on both carpels, rarely one carpel almost bare.—*Dimetopia cyanopetala*, *P. Muell. Fragm.* i. 231.

N. S. Wales. Between the Upper Bogan and Lachlan rivers, *L. Morton*.

Victoria. Murray river, *F. Mueller*.

W. Australia. Swan River, *Drummond*, 1st Coll.; 2nd Coll. n. 30, *Murchison* river, *Oldfield*.

3. ***T. eriocarpa*, Benth.** An annual, closely resembling the taller and more simple specimens of *T. pusilla* in everything except the fruit. Stems often 6 in. high or more. Leaves deeply 3- or 5-lobed, with linear or cuneate entire or 2- or 3-lobed divisions. Involucral bracts acute, about as long as the pedicels. Flowers 6 to 12 in the umbel. Fruits on pedicels of 1 to 2 lines, scarcely larger than in *T. pusilla*, and of the same shape, but so densely covered with a white cottony almost spongy wool as to make them appear much

larger and nearly globular.—*Dimetopia eriocarpa*, F. Muell. in Trans. Vict. Inst. 1855, 127, and in Hook. Kew Journ. viii. 70; *Cesatia ornata*, Endl. in Ann. Wien. Mus. ii. 200.

S. Australia. Near Cudnaka, F. Mueller.

W. Australia. Swan River, *Drummond*, 1st Coll. n. 424, 2nd Coll. n. 29; Murchison river, *Oldfield*; South-west Bay and Oldfield river, *Maxwell*.

4. **T. villosa**, Benth. Erect, apparently annual or biennial, with the habit of *T. cœrulea*, but more hirsute with long spreading hairs. Leaves tripartite, the segments again deeply divided into 2 or 3 oblong-cuneate coarsely toothed lobes. Peduncles rigid, glabrous, bearing an umbel about $\frac{3}{4}$ in. diameter when in flower. Involucral bracts subulate, shortly united, rather shorter than the pedicels. Flowers very small. Calyx-teeth inconspicuous. Disk scarcely any. Fruit usually reduced by abortion to a single carpel, tuberculate or muricate on the surface, the dorsal rib expanded into a broad thin smooth wing.—*Didiscus villosus*, F. Muell. in Proc. Roy. Soc. Tasm. iii. 238; *Hemicarpus villosus*, F. Muell. in Hook. Kew Journ. iv. 18.

N. Australia. Tableland between the upper Victoria river and Hooker's and Sturt's Creeks, F. Mueller.

5. **T. cœrulea**, Grah. in Edinb. New. Phil. Journ. v. 380. A rather coarse erect annual or biennial of 1 to 2 ft., more or less hirsute. Leaves once or twice tripartite, with linear-cuneate 3-fid or incised acute lobes, the upper floral leaves small and simple or 3-fid. Peduncles long, bearing each an umbel of very numerous flowers, 1 to 2 in. diameter. Involucral bracts numerous, linear, nearly as long as the pedicels, shortly united into a turbinate base, the centre of the umbel occupied by a flat disk. Calyx-teeth obsolete. Petals usually blue, unequal, the external rather longer than the inner ones. Disk annular. Fruit usually ripening both carpels, from 2 to 3 lines broad, the surface granular-rugose. Styles rather long.—Bot. Reg. t. 1225; *Huegelia cœrulea*, Reichb. Iconogr. Exot. t. 201; *Didiscus cyaneus*, DC. Mem. Umbell. 28. t. 4; *D. cœruleus*, DC. in Hook. Bot. Mag. t. 2875, and Prod. iv. 72; Bunge in Pl. Preiss. i. 285.

W. Australia. Swan River, *Fraser*, *Drummond*, 1st Coll., *Preiss*, n. 2055.

In the wild specimens the fruits are scarcely above 2 lines broad, in the cultivated ones about 3 lines.

Var. *leucopetala*, F. Muell. Flowers (in the dried specimens) white. Fruits densely muricate.—Murchison river, *Oldfield*.

6. **T. australis**, Benth. Very near *T. cœrulea*, and perhaps only a variety. In the original western specimens the leaves are few and mostly radical or at the base of the stem, hispid with long hairs. Peduncles long and distant. Umbels rather smaller than in *T. cœrulea*, the involucral bracts linear-subulate and much shorter than the pedicels. In the eastern plant the stems are coarser and more leafy, the hairs fewer and sometimes the whole plant nearly glabrous. Peduncles on the main stem sometimes several together so as to form a large irregular compound umbel, the involucral bracts very short. In both series the fruits have in some specimens or in some umbels both carpels perfect, in others one is constantly abortive, and all var. from quite smooth to more or less tuberculate.—*Didiscus pilosus*, Benth. in Hueg. Enum. 54; Hook. f. Fl. Tasm. i. 154; Hook. Ic. t. 307; *Dimetopia*

anisocarpa and *D. grandis*, Turcz. in Bull. Mosc. 1849, ii. 29; *Didiscus anisocarpus* and *D. grandis*, F. Muell. in Proc. Roy. Soc. Tasn. iii. 238.

Queensland. Newcastle range, F. Mueller.

N. S. Wales. North of Bathurst, A. Cunningham; Mooni Creek, Mitchell; New England, Beckler.

Victoria. Sandy hills, Port Phillip, and near Sandridge, F. Mueller; "Native Parsnip," Robertson.

Tasmania. Coasts between Circular Head and Woolnoth, J. D. Hooker, and others.

W. Australia. King George's Sound to Swan River, Hugel, Drummond, Ath Coll. n. 132 and 133; Perongerup range, Maxwell.

7. **T. glaucifolia**, Benth. Apparently an annual or biennial, resembling in every respect the more glabrous forms of *T. pilosa*, except that the whole plant is perfectly glabrous, and, according to F. Mueller, glaucous-pruinose when fresh, and the involueral bracts are usually but not always broader.—*Didiscus glaucifolius*, F. Muell. in Linnæa, xxv. 395.

N. S. Wales. Near Duroodoo towards the Barrier Range, Victoria Expedition.

S. Australia. Near Elders Range, F. Mueller; Flinders Range, Howitt's Expedition; Finke river, M'Donnell Stuart.

8. **T. glandulosa**, Benth. Erect and apparently annual or biennial, with the habit of *T. pilosa*, hirsute with short glandular hairs. Leaves shortly petiolate, deeply divided (but not to the base) into 3 oblong-cuneate rather broad coarsely-toothed or incised lobes. Peduncles long, glandular-hirsute. Flowers small, in umbels of about $\frac{3}{4}$ in. diameter. Involueral bracts shorter than the pedicels, united at the base. Calyx-teeth obsolete. Disk broad, rather thick. Fruit reduced by abortion to a single carpel, about 2 lines long and almost as broad, granular-tuberculate, not winged.—*Didiscus glandulosus*, F. Muell. in Proc. Roy. Soc. Tasn. iii. 238.

N. Australia. Nicolson river, Gulf of Carpentaria, F. Mueller.

9. **T. incisa**, Rudge in Trans. Linn. Soc. x. 300. t. 21. Glabrous or rarely with a few long hairs on the radical leaves. Stems from a thick perennial root-stock erect, thin but rigid, 1 to 2 ft. high. Leaves chiefly radical or on the lower part of the stem, on long petioles, not large, 3- or 5-partite, the segments often again twice trifid with narrow acute lobes, the upper leaves few small and less divided. Peduncles long. Umbels smaller and often much smaller than in *T. carulea*. Bracts much shorter than the pedicels. Flowers small. Calyx-teeth more distinct than in the preceding species. Disk very prominent. Fruit ripening both carpels, about 2 lines broad, obtusely muricate.—*Didiscus albiflorus*, DC. Prod. iv. 72.

Queensland. Near Brisbane, Mrs. Dietrich.

N. S. Wales. Port Jackson to the Blue Mountains, R. Brown, Sieber, n. 120, and others. Hastings and Clarence rivers, Beckler; New England, C. Stuart, Gwydir river, Eichhardt.

Var. *pilosa*. Sprinkled with a few long hairs; umbels rather larger, -N. coast, R. Brown. Clarence river, Beckler.

10. **T. procumbens**, Benth. Stems from a perennial rootstock elongated, procumbent or ascending, slender, quite glabrous. Leaves of the stem as well as the lower ones on slender petioles, tripartite, each segment again deeply divided into narrow-cuneate or lanceolate toothed or incised



lobes, mostly acute, with a few glandular hairs at the base and at the summit of the petiole, otherwise usually glabrous. Peduncles long and slender. Umbels rarely above $\frac{1}{2}$ in. diameter with numerous small flowers on filiform pedicels of above 2 lines. Involucral bracts setaceous, much shorter than the pedicels. Calyx-teeth minutely prominent. Disk shortly cup-shaped. Fruits usually ripening both carpels, about $1\frac{1}{2}$ lines broad, smooth, or tubercular mucicate. — *Didiscus procumbens*, F. Muell. in Proc. Roy. Soc. Tasm. iii. 237.

Queensland. Brisbane river, Moreton Bay, *F. Mueller*, *Leichardt*, *Mrs. Dietrich*; Lizard Island, *M'Gillivray*.

11. **T. hemicarpa**, *Benth.* Stems from a perennial stock, erect, glabrous or sprinkled with a few long hairs. Leaves on the lower part of the stem rather small, on rigid petioles, broadly cuneate or deeply 3-lobed, coarsely and acutely toothed or lobed, upper leaves small and linear. Peduncles slender. Umbels dense, scarcely above $\frac{1}{4}$ in. diameter, but rather numerous, in a loose terminal panicle. Flowers very small, calyx with 1 or 2 teeth usually prominent and shortly subulate. Fruit reduced by abortion to 1 carpel about $1\frac{1}{2}$ lines long, granular or tuberculate. — *Didiscus hemicarpus*, F. Muell. in Trans. Bot. Soc. Edinb. vii. 491; *D. setulosus*, F. Muell. in Proc. Roy. Soc. Tasm. iii. 238; *Hemicarpus didiscoides*, F. Muell. in Hook. Kew Journ. vi. 18.

N. Australia. Barren plains from Point Pearce to the mouth of the Victoria river, *F. Mueller*.

Var. *major*. Taller, umbels larger, with more numerous flowers. — Lacrosse Island, Cambridge Gulf and Vansittart Bay, *A. Cunningham*; elevated land, Cape Lambert, *Nichol Bay*, *Gregory's Expedition*; Glenelg district, *Martin*.

Var. ? *rotundifolia*. Leaves nearly orbicular, toothed only, not lobed. — Port Essington, *Armstrong*.

12. **T. humilis**, *Benth.* Stock perennial and densely tufted. Leaves radical, on long petioles, ovate or oblong, entire and obtuse or obtusely 3- or 5-lobed, mostly $\frac{1}{2}$ to 1 in. long, rather thick, glabrous or sprinkled with a few hairs. Peduncles or scapes usually longer than the leaves and sometimes 6 in. to 1 ft. high, with a single terminal umbel of about $\frac{1}{2}$ in. diameter. Flowers numerous. Involucral bracts linear, shorter than the pedicels. Calyx-teeth obsolete. Disk annular. Fruit ripening both carpels, $1\frac{1}{2}$ to 2 lines broad, smooth, the inner circle formed by the intermediate ribs often very small. — *Didiscus humilis*, Hook. f. in Hook. Ic. t. 304, and Fl. Tasm. i. 154.

Victoria. Alpine and subalpine pastures in the Australian Alps, *F. Mueller*.

Tasmania. Abundant in subalpine situations, *J. D. Hooker*.

3. SIEBERA, Reichb.

(*Trachymene*, DC., not of *Rudge*; *Fischera*, *Spreng.* (partly), *Sut.*: *Platysnee*, *Bunge*; *Platycarpidium*, *F. Mueller*.)

Calyx-teeth small but usually conspicuous. Petals entire, induplicate-valvate or slightly imbricate, concave, with the end inflexed, the midrib prominent inside, the bud prominently 5-angled. Disk flat and thick, or scarcely any besides the thick conical base of the styles. Fruit laterally compressed.

slightly notched at the base, without vittæ; carpophore persistent; carpels more or less turgid, but flattened at the commissure, the dorsal rib usually prominent, the lateral ones concealed in or slightly prominent at the narrow commissure, the intermediate ones usually faint. Seed more or less compressed but often not filling the cavity.—Rigid herbs with a perennial almost woody stock and virgate branches, or heath-like shrubs, glabrous or slightly glandular-pubescent. Leaves all entire or the lower ones divided or all reduced to small scales, without stipules. Umbels compound or rarely simple, terminal. Involucral bracts small. Flowers small, white. Fruit small.

The genus is confined to Australia.

Perennials or undershrubs. Stems leafless or the lower leaves divided, the upper ones linear-subulate.

Stems flattened or 2-winged, nearly leafless. Fruits broader than long 1. *S. compressa*.

Stems terete angular or scarcely flattened.

Stems nearly leafless except a few divided small leaves at the base. Fruits as long as broad.

Umbels compound 2. *S. juncea*.

Umbels all simple 3. *S. haplosciadia*.

Stems leafless, twining. Fruits very flat, with acute edges broader than long 4. *S. cirrosa*.

Stems diffuse, leafy.

Lower leaves divided, upper ones subulate. Fruits broader than long 4. *S. heterophylla*.

Leaves all or nearly all divided. Fruits as long as broad.

Peduncles short. Carpels turgid at the dorsal edge, broadly flat towards the commissure 5. *S. tenuissima*.

Stems rigid, erect, branches divaricate. Peduncles long, rigid.

Carpels turgid in the centre, flat at the dorsal edge and commissure 6. *S. dissecta*.

Shrubs with numerous small narrow leaves. Fruits nearly flat or with a broad flat furrow at the commissure. Western species.

Leaves erect or spreading.

Umbels nearly sessile. Carpels turgid and very obtuse at the dorsal rib 7. *S. commutata*.

Umbels on slender peduncles. Carpels slightly turgid in the middle, the dorsal edge acute 8. *S. effusa*.

Leaves closely reflexed. Fruit of *S. effusa* 9. *S. deflexa*.

Large leafy shrub. Fruits very flat, with acute edges. Eastern species 10. *S. valida*.

Leafy shrubs. Carpels wholly turgid except a narrow furrow at the commissure. Eastern species.

Leaves narrow-linear or subulate, all entire.

Leaves short. Stems short and diffuse, usually glandular-pubescent 11. *S. ericoides*.

Leaves mostly $\frac{1}{2}$ in. or more. Stems ascending or erect, usually quite glabrous 12. *S. linearifolia*.

Leaves orbicular, obovate, ovate or lanceolate, all entire 13. *S. Billardieri*.

Lower leaves or nearly all deeply 3- or 5-lobed, rigid, very acute, almost pungent 14. *S. Stephensonii*.

1. *S. compressa*, *Benth.* Stems from a perennial rootstalk herbaceous but rigid, $\frac{1}{2}$ to 2 ft. high, very flat and striate or more or less distinctly bordered by 2 opposite herbaceous wings, the whole sometimes very narrow, sometimes attaining a breadth of 2 or 3 lines; branches either few and straight or flexuose, or more numerous and divaricate. Leaves few, small,

setaceous, entire, or the lower ones once or twice 2-fid, or all reduced to minute scales. Umbels terminal or on short lateral branches, $\frac{1}{2}$ to 1 in. diameter, more or less compound, with slender divaricate rays, 2 or 3 of the larger ones bearing an umbellule sometimes again compound, whilst some of the rays of the general umbel are reduced to simple pedicels. Involucral bracts few and small. Fruits about 1 line broad and $\frac{1}{4}$ line long, the carpels turgid, leaving a rather narrow commissural furrow, the dorsal edge obtuse. — *Azorella compressa*, Labill. Pl. Nov. H. L. i. 75. t. 101; *Trachypnea compressa*, Spreng.; DC. Prod. iv. 73; *T. ameyi*, DC. l. c.; Bunge in Pl. Preiss. i. 288; *T. platyptera*, Bunge, l. c. 287; *T. stricta*, Bunge, l. c. 288.

W. Australia. King George's Sound and adjoining districts and thence to Swan River, Labillardière, R. Brown and others, *Drummond*, n. 93; *Preiss*, n. 2059, 2060, 2061, 2062, 2063.

Var. pycnantha. Stems very slender, scarcely flattened, but the fruit of *S. compressa*, not of *S. juncea*.—*T. filiformis*, Bunge in Pl. Preiss. i. 289.—Swan River, *Preiss*, n. 2058.

I have been quite unable to sort the specimens into distinct groups, according to the breadth of the stem, which is often variable on the same specimen, and unaccompanied by any corresponding character. In general those gathered on the seacoast appear to have the stems the most dilated.

2. ***S. juncea*, Benth.** Stems erect, almost leafless, terete, angular, or slightly compressed, either rushlike and 1 to 2 ft. high, or shorter more branched and flexuose, or slender and intricately branched. Leaves reduced to a few filiform scales, or a few, at the base of the stem or on very short barren shoots, $\frac{1}{2}$ to 1 in. long and once or twice trifid. Umbels in the taller varieties terminal, compound, larger and more dense than in *S. compressa*, smaller on the slender branching specimens. Involucral bracts few, small, linear, and reflexed or rarely elongated. Fruit rather more than 1 line long and broad, the carpels somewhat turgid, granular-tuberculate, leaving a very narrow smooth furrow on each side between them at the commissure, the dorsal edge almost acute.—*Trachypnea juncea* and *T. teres*, Bunge in Pl. Preiss. i. 286.

W. Australia. Swan River and thence to King George's Sound, *Drummond*, 1st Coll. and n. 16, 91; *Preiss*, n. 2069, 2083, and some specimens under 2082.

Var. ramosissima. Stems shorter, more branched and slender than in the common form. *Trachypnea ramosissima*, Benth. in Hueg. Enum. 54; *T. caudatifera*, Bunge in Pl. Preiss. i. 287, *Trachypnea filiformis*, Turcz. in Bull. Mosc. 1849, ii. 29. Swan River and King George's Sound, *Drummond*, 4th Coll. n. 138; *Preiss*, n. 2057.

Var. pendula. Stems short, slender, much branched, the rays reflexed with small, less compound umbels.—*Trachypnea pendula*, Benth. in Hueg. Enum. 54. *T. scabrescens*, Bunge in Pl. Preiss. i. 287. King George's Sound and neighbouring districts, R. Brown, *Drummond*, 3rd Coll. n. 228; *Preiss*, n. 2075.

3. ***S. haplosciadia*, Benth.** Stems from a perennial rootstock apparently leafless, terete or angular, erect and rushlike, but the upper branches often flexuose or recurved as in the *var. pendula* of *S. juncea*. Leaves few, minute, entire or trifid. Umbels terminal, all simple, with very numerous flowers, on short slender pedicels. Involucral bracts linear, reflexed, broader than in *S. juncea*. Fruit about as long as broad, as in *S. juncea*, but smoother and flatter, the dorsal edge more acute, almost winged, the lateral ribs at the commissure thickened and almost as prominent as the somewhat turgid centres of the carpels, but separate from them on each side by a narrow furrow. Styles with a thick conical base, without the broad disk of *S. compressa*.

W. Australia, Drummond, 2nd Coll. n. 19; Gales Brook, Maxwell.

4. **S. cirrosa**, Benth. Rhizome said to be tuberous. Stems terete, rush-like, slender, often twining and spreading over bushes, leafless or with a very few small subulate scale-like leaves (the base of the stem however not seen). Umbels compound, terminal, the rays rather long and slender. Involucral bracts few, small, and narrow. Petals obtuse and slightly imbricate. Fruits very flat, not tuberculate, about 3 lines broad and 2½ lines long, the dorsal edge very acute, the carpels convex on each side in the centre with the intermediate ribs slightly prominent.—*Platysace cirrosa*, Bunge in Pl. Preiss. i. 285; F. Muell. Fragm. i. 231.

W. Australia. Swan River, Drummond (2nd Coll. 5), n. 15, Preiss, n. 2661, 8 Hutt river, Oldfield.

4. **S. heterophylla**, Benth. Stems from a hard woody base numerous, erect on the young plant, diffuse or decumbent when older, usually 6 to 8 in. long, but sometimes 1 ft., and more slender. Leaves narrow-linear, the lower ones once or almost twice trifid, the upper ones and sometimes nearly all entire. Umbels small, compound but of few rays, with 1 or 2 small involucral bracts. Calyx-teeth prominent. Disk broad. Fruits about 1 line broad and not so long, didymous, more or less granular-tuberculate, the carpels turgid and rounded on the back, but with the dorsal rib prominent, shortly tapering towards the narrow commissure. — *Trachymene heterophylla*, F. Muell. 1st Gen. Rep., erroneously referred to *T. ramosissima*, Benth., by Klatt in Linnea, xxix. 708.

Victoria. Sandy hills, chiefly near the sea, from the Glenelg to Gipps' Land, F. Mueller, Robertson, and others.

S. Australia. Mount Barker district, F. Mueller; Marble ranges, Wilhelmi.

When the lower leaves are wanting, this species often resembles some specimens of *S. linearifolia* or of *S. ericoides*, but is readily known by the shape of the fruit.

5. **S. tenuissima**, Benth. Stems diffuse, elongated sometimes to above 1 ft., branched, almost filiform. Leaves mostly once or twice tripartite, with narrow-linear very acute lobes or segments, a few of the upper ones small and entire. Umbels compound, on short slender peduncles. Bracts linear. Buds prominently 5-angled as in the rest of the genus, but the obtuse petals often slightly imbricate. Fruits rather above 1 line long and broad; carpels turgid at the dorsal edge, the flat part of the fruit in the centre broad, with a raised rib on each carpel near the narrow turgid part.

W. Australia, Drummond, 2nd Coll. n. 18.

6. **S. dissecta**, Benth. Stems erect, rigid, under 1 ft. high, with rigid divaricate branches. Leaves twice or thrice ternately divided into short but fine subulate lobes. Umbels compact, on thick rigid peduncles; rays numerous, the central one very short; all with many flowers, and one or two occasionally again compound. Involucral bracts few, those of the general umbel sometimes divided into a few subulate divaricate lobes. Calyx-teeth inconspicuous. Fruits about as long as broad, smooth or nearly so, the carpels slightly turgid in the centre, very flat at the dorsal edge and in the commissure, the intermediate ribs very fine or scarcely conspicuous.

W. Australia. Between Moore and Marchison rivers. Drummond, 6th Coll. n. 119.

7. **S. commutata**, *Benth.* Shrubby and heath-like, with virgate branches. Leaves often somewhat crowded, linear, rather thick, obtuse or almost acute, 2 to 4 lines long, smooth and nerveless, often slightly twisted. Umbels compound, but compact and not large, on a peduncle not exceeding the last leaves. General involucre of 2 or 3 bracts resembling the stem-leaves, partial ones very small. Calyx-teeth prominent and connected by a narrow border. Fruits nearly orbicular, not quite 1 line broad, the carpels turgid towards the very obtuse dorsal edge, gradually flattened to the commissure, the lateral ribs joined in a single slightly prominent rib at the commissure, the intermediate ones inconspicuous or very slightly prominent.—*Trachymene commutata*, Turcz. in Bull. Mosc. 1849, ii. 30.

W. Australia. Drummond, 3rd Coll. n. 229, 4th Coll. n. 136, towards Cape Riche, Harvey; also in Maxwell's collection.

8. **S. effusa**, *Benth.* Shrubby and heath-like with slender virgate branches. Leaves linear or linear-cuneate, mostly obtuse, narrowed to the base, 2 to 4 lines long, often crowded on the barren branches. Umbels compound, on slender peduncles much longer than the leaves, each with 4 to 8 rays all bearing partial umbels. Involucral bracts very small and slender or none. Calyx-teeth prominent. Styles on a broadly conical base. Fruits flat, about 1 line broad and scarcely so long, notched at the base, smooth or slightly rugose, the carpels scarcely turgid, with the dorsal edge acute, the lateral ribs contiguous or somewhat distinct at the commissure, the intermediate ribs sometimes inconspicuous, sometimes slightly prominent and curved almost as in *Trachymene*.—*Trachymene effusa*, Turcz. in Bull. Mosc. 1849, ii. 31; *Platysace trachymenioides*, F. Muell. Fragm. i. 232.

W. Australia. Between Swan River and King George's Sound, Harvey, Drummond, n. 33, and 4th Coll. n. 135; various places eastward from W. Moat Barren to Point Malcolm, Maxwell, also Champion Bay, Walcott, with slightly rugose fruits. The species often much resembles *S. commutata*, but is readily distinguished by the longer peduncles and the fruit.

9. **S. deflexa**, *Benth.* Shrubby and virgate or much branched. Leaves usually crowded and closely reflexed on the branches, from broadly lanceolate to linear, obtuse, rather thick, rarely 2 lines long and often only 1 line, the upper ones sometimes almost orbicular. Umbels compound, on rather long slender peduncles, with 3 to 6 slender rays, each bearing a partial umbel. Involucral bracts few and small or none. Calyx-teeth prominent. Fruits as in *S. effusa*, very flat, about 1 line broad and scarcely so long, notched at the base, smooth, the carpels slightly turgid about the centre, the dorsal edge acute, the lateral ribs contiguous at the commissure, the intermediate ones curved, often inconspicuous.—*Trachymene deflexa*, Turcz. in Bull. Mosc. 1849, ii. 31.

W. Australia. King George's Sound to Cape Riche, Harvey, Drummond, 4th Coll. n. 137; eastward to Israelite Bay and Eagle Hawk Camp, Maxwell.

10. **S. valida**, *Benth.* A tall shrub. Leaves linear or linear-lanceolate, narrowed at both ends, 1 to 2 in. long, coriaceous, faintly 3-nerved. Umbels compound, numerous, forming a broad terminal panicle; rays usually 3 or 4, the central one very short, all bearing partial umbels, sometimes again compound. Involucral bracts few and small. Calyx-teeth shortly prominent.

Petals sometimes slightly imbricate. Fruits very flat, about 3 lines broad and 2 lines long, carpels not turgid, with the dorsal edge acute, the intermediate curved ribs slightly raised.—*Platycarpidium validum*, F. Muell. in Hook. Kew Journ. ix. 310; *Platysace valida*, F. Muell. Fragn. i. 232.

Queensland. Burdekin river, F. Mueller; Bowen river, Bowman; Rockingham Bay, Dallachy.

11. ***S. ericoides*, Benth.** A small, much-branched, divaricate or diffuse shrub, glabrous or more frequently glandular-pubescent towards the ends of the branches. Leaves all entire, linear or subulate, acute, more spreading than in *S. linearifolia*, rarely exceeding $\frac{1}{2}$ in. and mostly shorter. Umbels compound, but small and compact, very shortly pedunculate, with few rays. Involucral bracts short, linear. Fruit nearly as in *S. linearifolia*, but less rugose or quite smooth, the carpels usually more turgid and often furrowed at the intermediate rib, besides the commissural furrow. *Trachymene ericoides*, Sieb. in DC. Prod. iv. 738; *T. tenuis* and *T. subvelutina*, DC. l. c.

Queensland. Moreton Island, M'Cillivray.

N. S. Wales. Port Jackson to the Blue Mountains, R. Brown, Sieber, n. 121, and others; northward to Hastings and Clarence rivers, Beckler, and southward to Illawarra, A. Cunningham.

Victoria. Avon river, in Gipps' Land, F. Mueller.

Var. *thymifolia*, A. Cunn. Leaves small (not above 2 lines long), oblong-linear or lanceolate, acute, with recurved margins.—Barren spots, forest land, Moreton Bay, A. Cunningham.

The species is often scarcely to be distinguished from *S. linearifolia*.

12. ***S. linearifolia*, Benth.** Shrubby and glabrous with slender branches, decumbent, ascending or erect. Leaves all entire, narrow-linear or subulate, acute, mostly $\frac{1}{2}$ to 1 in. long. Umbels compound, on slender peduncles, usually exceeding the last leaves, with 3 or 4 or rarely more slender rays. Involucral bracts small, linear. Calyx-teeth shortly prominent. Disk broad with a thickened margin. Fruit about 1 line long and broad, more or less rugose, the ribs scarcely conspicuous; carpels turgid with a broad obtuse back, leaving only a narrow groove at the commissure.—*Azorella linearifolia*, Cav. Ic. v. 57. t. 485; *Trachymene linearis*, Spreng.; DC. Prod. iv. 73; *Fischera linearis*, Sm. in Rees Cycl. Suppl.

N. S. Wales. Port Jackson to the Blue Mountains, R. Brown, Sieber, n. 126, and others; near Richmond, *Wilhelmi*; New England, C. Stuart.

The species passes almost into *S. ericifolia* on the one hand, and the narrow-leaved varieties of *S. Billardieri* on the other.

13. ***S. Billardieri*, Benth.** A shrub, either low and diffuse or erect and attaining 2 or 3 ft., glabrous or with minutely pubescent branches. Leaves orbicular, obovate, ovate, elliptical, cuneate, or broadly or narrow-lanceolate, acute or obtuse, narrowed at the base and almost petiolate or closely sessile and rounded at the base, mostly under $\frac{1}{2}$ in. long when broad and obtuse, often above 1 in. when narrow and acute. Umbels compound, sessile or pedunculate, but the peduncles rarely long; rays often numerous but sometimes few. Involucral bracts linear, small, or rarely as long as the rays. Fruit about 1 line long and broad, more or less tubercular or rugose, the ribs scarcely conspicuous, or both the dorsal and intermediate ones pro-

minent, or the latter depressed. Carpels turgid, leaving a narrow furrow between them at the commissure.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, n. 122, 124, 125, and *W. Mett.* n. 542, 617, and southward to Illawarra, *Shepherd*, and Twofold Bay, *A. Cunningham*.

Victoria. Gipps' Land, barren ranges beyond Snowy River, Ball's Ranges, Grampians, *F. Mueller*.

A most variable species as to the form of the leaves, and might indeed include the preceding two species as well as the following six varieties, which appear generally to be found in the same situations, and most of them, however different their extremes, to pass into each other by the finest gradations, or even to show leaves of very different forms on the same plant. Even *S. heterophylla* and *S. Stephensonii*, with the lower leaves divided, may not be quite constant in the characters separating them from *S. Billardieri*.

a. conferta. Leaves crowded, orbicular, about $\frac{1}{2}$ in. diameter. Umbels dense, sessile.—*Trachypogon conferta*, Gaud. ; Benth. in Hugg. Eunn. 54; *T. ovalis*, var. *conferta*, DC. Prod. iv. 73.

b. ovata. Leaves ovate, more or less acute, rounded at the base. — *Azorella ovata*, Labill. Pl. Nov. Holl. i. 74. t. 100; *Trachypogon ovata*, Spreng. ; DC. Prod. iv. 73. *T. ovalis*, DC. l. c. ; *T. brevifolia*, Sieb. Pl. Exs. ; *Psichea ovata*, Sm. in Ross Cycl. Suppl.

c. angustifolia. Leaves ovate-lanceolate or oblong, including every shape between the forms *b* and *d*. — *Trachypogon angustifolia*, Sieb. in DC. Prod. iv. 73.

d. lanceolata. Leaves lanceolate, acute, narrowed at the base, mostly above $\frac{1}{2}$ in. long. — *Azorella lanceolata*, Labill. Pl. Nov. Holl. i. 74. t. 99. *Trachypogon lanceolata*, Spreng. ; DC. Prod. iv. 73 ; Bot. Mag. t. 3334; *Psichea lanceolata*, Sm. in Ross Cycl. Suppl.

e. emutata. Leaves more or less emarginate cuneate obovate or oblanceolate, narrowed at the base and almost petiolate. Umbels on petioles longer than the leaves. Gipps' Land, *F. Mueller*. This variety, rather more distinct than the preceding ones, may, by some, be considered as a species.

f. crassifolia. Leaves crowded, orbicular obovate or oblong, very small and thick. — *Trachypogon crassifolia*, Benth. in Hugg. Eunn. 54. Apparently rare, the only specimens I have seen are in Brown's and in Fraser's collections, and at first sight it appears to be a well-marked species, but the differences may possibly be due to a seacoast station.

14. **S. Stephensonii**, Benth. Shrubby with virgate branches, glabrous or nearly so, very nearly allied to the var. *ovata* of *S. Billardieri*, but the leaves linear-lanceolate or lanceolate, rigid, very acute, almost pungent, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, and the lower ones or nearly all deeply divided into 3 spreading segments, the outer ones sometimes again 2-lobed. Umbels compound, sessile within the last leaves. Fruit of *S. Billardieri*, very tubercular-rugose. — *Trachypogon Stephensonii*, Turcz. in Bull. Mosc. 1847, i. 170.

N. S. Wales, *Stephenson*, n. 284, "within 125 miles of Sydney" on the printed labels.

4. XANTHOSIA, Rudge.

(*Leucolæna*, *R. Br.* ; *Schœnolæna*, *Bunge* ; *Peutapeltis*, *Bunge*.)

Calyx-lobes orbicular ovate or lanceolate, petiole cordate or not attached by the whole of the base. Petals with an induplicate point and reduplicate margins, slightly imbricate or almost valvate. Disk of 2 prominent lobes or glands at the back of the styles or rarely almost flat. Fruit laterally compressed, notched at the base with rounded auricles, without vittæ, the carpophore persistent, the dorsal edge of the carpels obtuse, the primary and often some of the secondary ribs prominent and curved at the base. Seed somewhat compressed. — Herbs or small shrubs, diffuse or decumbent at the

base or erect, often clothed with soft long hairs mixed with a stellate tomentum. Leaves toothed, lobed or ternately divided. Umbels usually compound, the partial ones with two or three bracts and several almost sessile flowers, the general one of 3 or 4 rays and as many bracts, but sometimes the whole umbel reduced to very few or to a single flower.

The genus is confined to Australia.

Umbels dense or few-flowered. Bracts of the involucre narrow or small or herbaceous or rigid and chaff-like.

Leaves slender, nearly terete, chiefly radical. Stems long and rigid.

Umbels compact, compound, with rigid chaff-like bracts.

Calyx-lobes orbicular peltate 1. *X. juncea*.

Calyx-lobes cordate-auriculate, acute 2. *X. tenuior*.

Leaves orbicular-cordate or reniform, coriaceous, sinuate-toothed or shortly lobed, glabrous or tomentose.

Calyx-lobes orbicular-peltate. Umbels compound. Bracts narrow, rigid 3. *X. peltigera*.

Calyx-lobes acute, neither cordate nor peltate. Umbels few-flowered. Bracts small, coloured 4. *X. hederifolia*.

Leaves thin, ovate obovate or oblong, entire or toothed, white underneath. Umbels few-flowered. Bracts small, coloured. 5. *X. candida*.

Leaves cuneate, equally 3-toothed or entire, mostly white-tomentose underneath.

Umbels pedunculate, 1- to 4-flowered. Calyx-lobes shortly peltate 6. *X. tridentata*.

Umbels nearly sessile, 1-flowered. Calyx-lobes not peltate 7. *X. singuliflora*.

Leaves ovate to lanceolate, lobed. Plant usually pilose and tomentose. Umbels nearly sessile or rarely pedunculate, 1- to 4-flowered 8. *X. pilosa*.

Leaves narrow, entire, 3-partite or ternately divided. Low, diffuse or much-branched plants.

Leaves simple. Umbels 3- to 9-flowered. Calyx-lobes auriculate 9. *X. ciliata*.

Leaves 3-partite or ternately divided.

Umbels 1- to 4-flowered.

Leaves 3-partite, with entire or 2-lobed narrow segments.

Umbels mostly sessile 10. *X. pusilla*.

Leaves 3-partite, with 2- or 3 lobed cuneate segments.

Umbels on slender peduncles 11. *X. fruticulosa*.

Umbels irregularly compound, with several flowers in each umbellule.

Leaves 3-partite, with entire or 2-lobed segments 12. *X. Huegelii*.

Leaves twice 3-partite or more divided 13. *X. dissecta*.

Umbels compound, of 3 to 5 distinct rays of several flowers each, besides a central cluster of flowers. Partial involucre of 3 broad petal-like coloured bracts, exceeding the flowers.

Flowering-branches leafy. Leaves toothed or lobed.

Glabrous or woolly-tomentose. Leaves orbicular, toothed 17. *X. rotundifolia*.

Hirsute with long hairs and stellate-tomentose. Leaves ovate, lobed 15. *X. vestita*.

Leaves chiefly radical or at the base of the stems, divided.

Stems elongated and branched. Leaves 3-partite, with cuneate-toothed or lobed segments 16. *X. Atkinsoniana*.

Stems short, not much branched. Leaves 3-partite, with linear divided segments.

Peduncles much longer than the leaves 14. *X. peduncularis*.

Peduncles shorter than the leaves 13. *X. dissecta*.

1. **X. juncea**, *Benth.* Quite glabrous. Stems from a thick rhizome, ascending or erect, slender but rigid, 1 to 2 ft. long. Leaves very few and chiefly radical, linear-terete, those on the stem very small and distant. Peduncles long and slender, bearing a compact irregularly compound umbel of 3 or 4 very short rays, almost contracted into a head. Involucral bracts, both general and partial, exceeding the flowers, rigid, glaucous-like, with white scarious margins, 3 to 4 lines long. Flowers nearly sessile, 3 or 4 in each partial umbel. Calyx-lobes short, orbicular, peltately attached by the centre. Petals narrow with an inflexed point. Disk-lobes glabrous. Fruit with the primary ribs only slightly prominent. — *S. juncea* et *juncea*, Bunge in Pl. Preiss. i. 289.

W. Australia. Swan River, *Preiss*, n. 2082; Vasse river, *Mrs. Molloy*.

2. **X. tenuior**, *Benth.* Very near *X. juncea*, with the same habit, linear-terete, almost subulate radical leaves, nearly leafless stems and compact inflorescence, but smaller and more slender in all its parts, and the calyx-lobes ovate acute, slightly cordate-auriculate at the base, but not at all peltate. — *Schoenolæna tenuior*, Bunge in Pl. Preiss. i. 290.

W. Australia. Near Albany, *Preiss*, n. 2080; King George's Sound, *Macleay*, *Harevey*.

3. **X. peltigera**, *Benth.* Quite glabrous. Stems from a perennial stock, numerous, ascending to 1 or 2 ft., more or less angular. Leaves on long petioles, broadly orbicular-cordate reniform or ovate-rhomboidal, often 1 to 2 in. broad, coriaceous, several-nerved, sinuate-toothed. Peduncles long, terminal or leaf-opposed. Umbels compound, usually of 4 to 6 many-flowered rays, with a few flowers in the centre. Involucral bracts linear-acute, rigid, striate, those of the general involucre about as long as the rays, the partial ones exceeding the flowers. Calyx-lobes broadly oblong, very obtuse, peltately attached by the centre. Petals shortly unguiculate, not inflexed at the tips. Disk scarcely prominent. Styles erect, straight, thickened in the middle so as to be almost fusiform. Fruit with the secondary ribs as well as the primary ones usually prominent. — *Isocaulis peltigera*, Hook. Ic. Pl. t. 45; *Pentapeltis peltigera*, Bunge in Pl. Preiss. i. 292.

W. Australia. Swan River, *Drummond*, n. 92, Darling Range, *Preiss*, n. 2081. King George's Sound, *Fraser*.

4. **X. hederifolia**, *Benth.* Stems elongated, weak, branching, diffuse, glabrous or tomentose when young. Leaves petiolate, orbicular-cordate, shortly and acutely 5- or 7-lobed, or coarsely toment, coriaceous, with revolute margins, glabrous above, densely woolly-tomentose underneath, rarely above $\frac{3}{4}$ in. diameter. Peduncles usually exceeding the leaves, with a compact irregularly compound umbel, most frequently of 2 or 3 short 1-flowered rays with 2 or 3 single flowers between them. Bracts of the general involucre narrow, partial ones about as long as the flowers, (purple?) coloured. Calyx-lobes purple, scarcely acute, neither peltate nor cordate. Disk-lobes large, glabrous. Petals narrow. Fruits rather large, the secondary ribs usually prominent as well as the primary ones.

W. Australia, *Drummond*, 5th Coll. n. 294.

5. **X. candida**, *Steud.*; Bunge in Pl. Preiss. i. 291. Stems long, slender,

diffuse, tomentose-pubescent or glabrous. Leaves from broadly ovate or orbicular to oblong-cuneate, coarsely and irregularly toothed or lobed or rarely entire, white-tomentose especially underneath when young, at length glabrous above, narrowed into a long petiole, the largest $\frac{1}{2}$ to 1 in. long, but mostly smaller. Peduncles slender, bearing a small compound umbel, usually of 4 short rays, each with 1 flower and 3 bracts, the central one narrow, like those of the general involucre, the 2 lateral ovate and more or less coloured, and 1 central flower without bracts. Calyx-lobes ovate, almost obtuse, not cordate. Petals narrow. Disk-lobes thick, depressed on the top, glabrous.—*Leucolæna candida*, Benth. in Hucg. Enum. 55.

W. Australia. King George's Sound, *R. Brown*; Swan River, *Huegel*, *Fraser*, *Preiss*, n. 2088; Sussex district, *Preiss*, n. 2077; Vasse, Harvey, Gordon and Blackwood rivers, *Oldfield*.

6. ***X. tridentata***, *DC. Prod.* iv. 75. Slender and diffuse, slightly tomentose and hirsute or nearly glabrous. Leaves cuneate, acutely and nearly equally 3-toothed at the end, mostly under $\frac{1}{2}$ in. long, glabrous or white-tomentose underneath. Peduncles slender, leaf-opposed or terminating short leafy branches, reflexed, irregularly 1- to 3-flowered or rarely 4- or 5-flowered, with 1 or 2 bracts to each branch or pedicel, and 3 or rarely 2 lanceolate acute bracts to each flower, about 2 lines long. Calyx-lobes acute, peltately attached a little above their base. Petals very narrow. Disk-lobes glabrous. Fruit with the lateral ribs distinct as well as the intermediate and secondary ones.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Leichhardt*, *Miss Atkinson*, *F. Mueller*; southward to Twofold Bay, *F. Mueller*.

Victoria. Wilson's Promontory, *F. Mueller*.

7. ***X. singuliflora***, *F. Muell. Fragm.* iv. 184. Stems slender, diffuse, much intricate, under 1 ft. long, glabrous or slightly tomentose. Leaves oblong-cuneate, acute, entire or 3-toothed at the end, narrowed into rather a long petiole, mostly under $\frac{1}{2}$ in. long, glabrous or white-tomentose underneath. Umbels reduced to a single flower, sessile or shortly pedunculate at the upper nodes, surrounded by 3 or 4 narrow bracts at the base of a very short pedicel, and 2 broader ones close under the flower. Calyx-lobes acute, not cordate nor peltate, with almost scarious margins. Petals inflexed at the points. Fruits with the secondary ribs prominent.

W. Australia. Near Cape Paisley, *Maxwell*.

8. ***X. pilosa***, *Rudge in Trans. Linn. Soc.* x. 301. t. 22. f. 1. An erect or more frequently diffuse or procumbent, much branched, leafy shrub, of 1 to 2 ft., copiously clothed with rather long hairs intermixed with a brown stellate tomentum, or very rarely in mountain situations becoming almost glabrous. Leaves cuneate, obovate, oblong, lanceolate or broadly ovate, coarsely sinuate-toothed, 3- or 5-lobed or rarely 3-partite, the central lobe always longer than the lateral ones, rarely exceeding 1 in., the petiole short, dilated and ciliate at the base, but without real stipules. Peduncles usually 2 together at the nodes, very short or slender and nearly as long as the leaves, each usually with 2 flowers, more rarely 3 or only 1, with 2 or 3 small narrow bracts forming a general involucre at the base of the short pedicels or rays, and 2 or 3 oblong-lanceolate bracts of 2 or 3 lines, forming a partial

involucre under each flower. Calyx-lobes rather thickened at the base, but neither cordate nor petiote. Petals narrow, with a long inflexed point. Disk-lobes thick, pubescent. Fruit rather above 1 line long and broad, the intermediate and secondary ribs prominent, the lateral ones scarcely distinct from the commissure. — *X. acutata*, Sieb. in DC. Prodr. iv. 74; Hook. f. Fl. Tasm. i. 155; *X. hirsuta*, DC. Prodr. iv. 74; *Leucoloma pubesc.*, Benth. in Hung. Enum. 55 (more densely villous, with longer leaves).

Queensland. Moreton Island, *F. Mueller*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, 1807, 217, 218 (the latter less hirsute), and others, to the southward, *J. C. Smallegange*; Port Phillip Bay, *F. Mueller*.

Victoria. Scrubby moist valleys in Gipps Land, *F. Mueller*.

Tasmania. Common in many places in the N. coast, *J. D. Hooker*.

One flowered and two flowered varieties, on which I have seen a frequently distinct leaf, occur sometimes on the same specimens. The leafless specimens, from the Blue Mountains, appear, at first sight, very distinct, but I cannot find any other difference than the want of hairs.

9. *X. ciliata*, Hook. Ic. Pl. t. 726. Diffuse and small, but more shrubby than the following species, pubescent or nearly glabrous. Leaves uncinated, linear-linear-oblong or linear-cuneate, entire or shortly 3-toothed, the petioles dilated and ciliate at the base. Peduncles short at the nodes or terminating short leafy branches, bearing a small compact more or less compound umbel of from 3 or 4 to three times as many flowers. Involucral bracts 3 to each partial umbel, linear-lanceolate, herbaceous, pubescent, not 2 lines long. Calyx-lobes cordate-mucronate, acuminate. Petals narrow. Disk-lobes glabrous. Fruits with the secondary ribs more or less prominent.

W. Australia. *Dracontid*, 1st Coll., also n. 237, 724, and 4th Coll., n. 139.

10. *X. pusilla*, Bunge in Pl. Preiss. i. 291. Small diffuse and densely branched, rarely exceeding 3 or 4 in. in the original form, more or less hirsute with spreading hairs. Leaves 3-partite, the segments from broadly elliptical and about $\frac{1}{4}$ in. to lanceolate and $\frac{1}{2}$ in. long or rather more, entire or the lateral ones 2-lobed, rather thick. Umbels sessile and leaf-opposed, or pedunculate in the axils and often reflexed, with 1 to 3 flowers, surrounded by narrow hirsute involucral bracts. Calyx-lobes very acute, neither cordate nor petiote. Disk-lobes large, concave. Petals very narrow, with inflexed points. Fruit rather large, the prominent ribs variable in number, usually 4 on each side. — Hook. f. Fl. Tasm. i. 156; *X. villosa*, Turcz. in Bull. Mosc. 1849, ii. 32.

Victoria. Wilson's Promontory, *F. Mueller*; near Portland, *Allott*.

Tasmania. Sandy soil, north shore, *J. D. Hooker*.

S. Australia. Lofly Range and near Adelaide, *F. Mueller*.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Wakfield*, *Baxter*, *Preiss*, n. 2078, *Dracontid*, 4th Coll. n. 139.

Var. *glabrata*. Stems elongated, slender and glabrous or nearly so. — *X. glabrata*, Bunge in Pl. Preiss. i. 290. King George's Sound, *Baxter*, shady woods, *Canning river*, *Preiss*, n. 2076. The differences shown by this form are probably owing to the situations it grows in.

11. *X. fruticulosa*, Benth. Diffuse, much-branched and slender, but more shrubby than the allied species, hirsute with soft hairs or at length glabrous. Leaves shortly petiolate, divided into 3 cuneate entire or more frequently 3-lobed segments, under $\frac{1}{2}$ in. long, glabrous or hairy but not tomentose. Peduncles filiform, exceeding the leaves, bearing each a scarcely

compound umbel of 2 to 4 flowers. Involucral bracts 4 to 6, ovate or ovate-lanceolate, scarcely coloured, spreading to a diameter of 2 or 3 lines. Flowers nearly sessile. Calyx-lobes acute, slightly auriculate. Petals much inflexed. Styles very short, not exceeding the disk-lobes. Fruits short, but not seen quite ripe.

W. Australia. Between Moore and Marchison rivers, *Drummond*, 6th Coll. n. 118.

12. **X. Huegelii**, *Steud.*; *Bunge in Pl. Preiss.* i. 291. Stems from a perennial or woody stock, erect or rarely diffuse, hirsute with spreading hairs, rarely exceeding 6 to 8 in. Leaves divided into 3 lanceolate or linear segments, entire or the lateral ones 2-lobed or 2-partite, usually $\frac{1}{2}$ to 1 in. long, villous or nearly glabrous. Peduncles short or long, with an irregularly compound umbel of 3 or 4 short rays, each with 3 to 6 sessile flowers, and 1 to 3 flowers pedicellate in the centre. Involucral bracts narrow, acute, herbaceous. Calyx-segments acutely acuminate, cordate at the base. Petals narrow. Disk-lobes large, undulate-lobed. Fruit usually with 6 ribs on each side.—*Leucolana Huegelii*, Benth. in *Hueg. Enum.* 55.

W. Australia. Swan River, *Huegel*; *Drummond*, 1st Coll. and n. 712; *Preiss*, n. 2090, and others. Resembles the long narrow-leaved forms of *X. pusilla*, but the flowers are much more numerous, and the calyx-lobes, disk, and fruit-ribs rather different.

13. **X. dissecta**, *Hook. f. in Hook. Ic. Pl. t.* 302, and *Fl. Tasm.* i. 155. Diffuse with a perennial stock, sometimes forming dense tufts and rarely exceeding 6 in., glabrous. Leaves on long petioles, once or twice 3-partite, with narrow cuneate or linear acutely 3-toothed or 3-lobed segments. Peduncles leaf-opposed or terminating short axillary branches, all shorter than the leaves although sometimes near 1 in. long, bearing in the original slender form small compound umbels of 2 or 3 short rays each with 2 or 3 flowers and the bracts small, but in the more luxuriant and stouter forms the umbels larger, the flowers more numerous, and the bracts larger and more coloured. Calyx-lobes acute, not peltate and scarcely cordate. Petals very narrow. Disk-lobes large, glabrous. Fruit very didymous, with only 4 ribs on each side, the secondary ones rarely conspicuous.—*X. leiophylla*, F. Muell.; Klatt in *Linnaea*, xxix. 710; *X. pinnatisecta*, F. Muell.; Klatt, l. c. 711.

N. S. Wales. Blue Mountains, *A. Cunningham*.

Victoria. From the Glenelg river, *Robertson*, to Gipps' Land, *F. Mueller*; Wimmera, *Dallachy*; Murray desert, *Irvine*.

Tasmania. Northern shores, Rocky Cape, *Georgetown*, *J. D. Hooker*.

S. Australia. S. coast, *R. Brown*; Rivoli Bay and Kangaroo island, *F. Mueller*; Port Lincoln, *Wilhelmi*.

Var. floribunda. More luxuriant. Umbels of 3 or 4 rays with a single flower in the centre and a general involucre of 3 or 4 small narrow bracts; partial umbels of 3 to 6 nearly sessile flowers and an involucre of 2 or 3 ovate-lanceolate or lanceolate coloured bracts.—To this variety belong several of the Victorian and S. Australian specimens. It is connected with the slender few-flowered forms by numerous intermediates, and scarcely differs from *X. peduncularis*, except in the short peduncles and less numerous flowers.

14. **X. peduncularis**, *Benth.* A rather small plant, forming sometimes close tufts, but with the appearance of being almost annual, glabrous or softly hirsute, attaining (with the inflorescence) 6 in. to 1 ft. Leaves



Botanische Illustration

mostly radical or at the base of the stem, on long petioles, once or twice 3-partite with linear or cuneate acutely-toothed or lobed segments like those of *X. dissecta*, the upper ones small, simple and linear. Peduncles much longer than the leaves, with a compound umbel like that of *X. rotundifolia*, but much smaller; rays 3 or 4, with a few central flowers. Bracts of the general involucre narrow, acute, the partial ones 3, broad and coloured, longer than the flowers, the lateral ones very oblique. Calyx-lobes slightly cordate, acute. Fruits with 4 or 6 prominent ribs on each side.

W. Australia, Drummond, 5th Coll. n. 292; Bremer Bay river, Maxwell.

15. *X. vestita*, Benth. Shrubby, with the dense stellate tomentum, long spreading hairs and foliage of *X. pilosa*, but with the umbels nearly of *X. rotundifolia*. Leaves very shortly petiolate, broadly ovate, irregularly and obtusely toothed and lobed, the larger ones above 1 in. long, tomentose and hirsute underneath, hirsute or at length nearly glabrous above. Peduncles longer than the leaves, solitary or 2 together, each with a rather large compound umbel of 3 or 4 rays with 1 or 2 central flowers. Bracts of the general involucre narrow, very hirsute, shorter than the rays, of the partial ones 3, obovate-oblong, obtuse, nearly equal, longer than the flowers, coloured and petal-like but villous outside. Calyx-lobes petal-like, obtuse, not cordate. Disk-lobes villous. Fruit with the secondary ribs usually prominent.

N. S. Wales. Hawkesbury river and Blue Mountains (C. Moore?) in Herb. F. Mueller.

16. *X. Atkinsoniana*, F. Muell. Fragm. ii. 127. Glabrous, or the young leaves floccose-tomentose. Stems from a perennial woody stock elongated, slender, ascending to 2 feet or more. Leaves chiefly radical or near the base of the stem, on long petioles, in the eastern specimens 3-partite with cuneate acutely toothed or deeply lobed segments, the central ones often longer and more divided, in the western specimens less divided with the lobes more entire and less acute, the upper leaves in both few, small, and scarcely divided. Peduncles long, with a compound umbel like that of *X. rotundifolia*, but smaller, especially in the eastern specimens, the coloured petal-like bracts of the partial involucre sometimes scarcely longer than the flowers. Calyx-lobes shortly and broadly cordate, acute. Fruits 4- or 6-ribbed.

N. S. Wales. Grassy open country north of Richmond, A. Cunningham; Clyde river, C. Moore; Blue Mountains, A. and E. Cunningham. Miss Atkinson.

W. Australia. Swan River, Drummond, 1st Coll.; Blackwood river, Oldfield; Bald Island, Tone river, and Lake Leven, Maxwell.

17. *X. rotundifolia*, DC. Prod. iv. 75. Stems erect, simple or slightly branched, often woody at the base, 1 to 2 ft. high, glabrous tomentose or rarely hirsute. Leaves not confined to the base of the stem, on short petioles, nearly orbicular, irregularly and acutely toothed, $\frac{3}{4}$ to $1\frac{1}{2}$ in. diameter, coriaceous, glabrous or woolly underneath especially when young. Peduncles long, bearing each a compound umbel larger than in most species; rays usually 4 with a sessile umbellule in the centre. Involucral bracts petal-like and coloured, those of the general involucre usually 4, ovate-lanceolate or rhomboidal, shorter than the rays, the partial ones 3, exceeding the flowers, often $\frac{1}{2}$ in. long, the lateral ones broadly semi-ovate and falcate, the central

one narrower and equal-sided. Flowers rather numerous, on very short pedicels. Calyx-lobes acute, often slightly cordate. Petals rather broad, the induplicate point ciliate. Fruits 4- to 6-ribbed on each side.—Bunge in Pl. Preiss. i. 292; Bot. Mag. t. 3582.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, and others; *Drummond*, 3rd Coll. n. 227; *Preiss*, n. 2066.

F. Maeller is disposed to unite the three preceding species with this one as varieties, but the foliage and habit are so different that until I have seen intermediate specimens I cannot but consider them as distinct.

5. AZORELLA, Lam.

(*Fragosa*, *Ruiz and Pav.*; *Pozoa*, *Lag.*; *Microsciadium*, *Hook. f.*; *Oschatzia*, *Walp.*; *Dichopetalum*, *F. Muell.*)

Calyx-teeth or lobes prominent, either small and acute or large petal-like and deciduous. Petals obtuse or acute, imbricate in the bud. Disk thick, flat, convex or confluent with the styles. Fruit slightly compressed laterally or scarcely broader than thick, the sides furrowed at the commissure (when quite ripe); carpels nearly terete or angular, with 5 more or less prominent nearly equidistant ribs, the lateral ones not close to the rather narrow commissure. Vitæ none. Carpophore short, persistent. Seed straight.—Perennials, the Australian species either tufted with radical leaves and peduncles or more slender with creeping runners. Leaves (in the Australian species) toothed or lobed but undivided, the base of the petiole rarely expanded into distinct scarious stipules. Umbels simple or rarely irregularly compound, the involueral bracts free or united.

The genus, which I have adopted in the extended sense given to it by *A. Gray* (*Bot. Amer. Expl. Exped.* i. 697) and *Weddell* (*Chloris Andina*, ii. 150), includes a considerable number of species from Andine and extratropical S. America, New Zealand and the Antarctic regions generally. Most of the Antarctic and Andine ones belong, however, to a group unrepresented in Australia, to which the genus is sometimes confined, in which the densely matted stocks covered with the imbricated remains of old leaves form large compact masses. The floral and carpological characters are very nearly the same throughout the genus. The fruit, however, must be examined quite ripe. Before that it is often almost equally 4-sided, the longitudinal furrows at the commissure scarcely perceptible.

Small *Hydrocotyle*-like plant, with creeping stolons and short slender ascending stems. Umbels several-flowered, terminal or sessile at the nodes

(*Hydrocotyle tetragonocarpa* has the fruits scarcely compressed, but the petals are valvate.)

1. *A. Muelleri*.

Tufted plants with radical leaves. Stems or scapes erect, leafless, simple or branched upwards. Flowers solitary or in irregular umbels of 2 to 6. Calyx-lobes not above half as long as the petals.

Leaves cuneate, 3- to 7-toothed or lobed at the end 2. *A. cuneifolia*.

Leaves broadly ovate-cordate, 5- to 9-lobed 3. *A. sacifraga*.

Tufted plant with radical leaves. Scapes erect, leafless, with an irregular umbel of 6 to 12 flowers sometimes compound.

Calyx-lobes petal-like and as long as the petals 4. *A. dichopetalum*.

1. **A. Muelleri**, *Benth.* A glabrous perennial with the aspect of a *Hydrocotyle*, the small tufted stock apparently emitting creeping stolons, the slender ascending stems rarely exceeding the radical leaves. Leaves orbi-

cular-cordate or reniform, shortly and obtusely 5- to 9-lobed and crenate, $\frac{1}{2}$ to $\frac{3}{4}$ in. diameter, the radical ones on long petioles. Stipules as in *Hydrocotyle* scarious, scarcely adnate to the petiole and jagged or ciliate. Umbels almost sessile at the nodes, the last one of the stem appearing pedunculate from the smallness of the floral leaf. Involucral bracts united at the base, membranous, lanceolate, about as long as the flowers, mostly with 1 or 2 setaceous teeth or lobes. Calyx-teeth ovate-triangular, petal-like, half as long as the petals. Petals almost acute, but thin and imbricate in the bud. Disk rather thick, flat or concave, surrounding the styles. Fruit ovoid, thick, slightly compressed laterally, furrowed at the commissure, but not seen ripe. — *Pozoa Fragosa*, F. Muell. in Trans. Phil. Inst. Viet. i. 102, and in Hook. Kew Journ. viii. 70.

Victoria. Under the shade of rocks on the summits of the Munyang mountains at an elevation of 6000 ft., *F. Mueller*.—This species in many respects approaches *Hydrocotyle* in character as well as in habit.

2. **A. cuneifolia**, *F. Muell.* (as a *Pozoa*). Perennial, forming a densely-tufted stock, quite glabrous. Leaves all radical on long petioles, cuneate, irregularly 3- to 7-lobed or toothed at the end, the narrowest sometimes entire. Flowering stems leafless except a small bract under each branch, erect, 6 in. to 1 ft. high, dichotomously-branched in the upper portion, each branch or peduncle bearing a single terminal flower or an irregular umbel of 2 to 9 flowers. Calyx-teeth minute or scarcely conspicuous. Petals broad, acute, much imbricate. Disk at first flat, but thick and soon becoming conical with the short styles terminating the lobes. Fruit ovoid, about 2 lines long, scarcely compressed, and slightly furrowed at the commissure between the lateral ribs; carpels with 5 equidistant prominent ribs.—*Centella cuneifolia*, F. Muell. in 1st Gen. Rep. and in Hook. Kew Journ. vii. t. 12; *Microsciadium cuneifolium*, F. Muell. in Hook. Kew Journ. vii. 379; *Pozoa cuneifolia*, F. Muell. in Trans. Phil. Inst. i. 103.

Victoria. In turf moss on Mount Macedon, the Cobblers mountains, and others of the Australian Alps, *F. Mueller*.

3. **A. saxifraga**, *Benth.* A small tufted perennial, quite glabrous. Leaves all radical, broadly ovate-cordate, under $\frac{1}{2}$ in. long, divided to about the middle or sometimes more deeply into 5 to 9 acute or obtuse lobes. Peduncles or scapes slender, 3 to 4 in. high, each with 1, 2 or 3 flowers on rather long pedicels and a bract under each pedicel. Calyx-teeth acute, nearly half as long as the petals. Petals long, attaining fully 1 line. Disk thick and conical. Fruit not seen ripe, but apparently the same as in *A. cuneifolia*.—*Microsciadium saxifraga*, Hook. f. in Hook. Lond. Journ. vi. 468, and Fl. Tasm. i. 159; *Oschaltzia saxifraga*, Walp. Ann. i. 140.

Tasmania. Wet heathy places, Loddon Plains, and Macquarrie Harbour, *Gunn*.

4. **A. dichopetala**, *Benth.* Perennial, with a densely-tufted stock, the leaves and peduncles often hispid with long rigid scattered hairs. Leaves radical, on long petioles, orbicular-cordate or reniform, $\frac{1}{2}$ to 1 in. diameter, shortly and broadly 5- to 7-lobed and crenate. Peduncles shorter or longer than the leaves, bearing an irregular umbel of 6 to 12 flowers, the pedicels very variable in length, and one sometimes bearing a partial umbel. Bracts

under the umbel very unequal and sometimes united at the base. Calyx-lobes petal-like, as large as the petals and falling off with them. Petals fully 1 line long, acute but slightly imbricate. Disk thick, at first slightly convex, afterwards conical.—*Dichopetalum ramentaceum*, F. Muell. in Hook. Kew Journ. vii. 378. t. 11, and in Trans. Phil. Inst. Vict. i. 102; Hook. f. Fl. Tasm. i. 157. t. 35.

Victoria. Munyang mountains at an elevation of 5000 to 6000 ft., F. Mueller.

Tasmania. Mount Sorrel, Macquarrie Harbour, Gunn, Milligan; Mount Lapeyrouse, Oldfield.

The Victorian specimens are sprinkled with a few of the long hairs which are very abundant on the Tasmanian ones, but there appears to be no other difference.

6. *DIPLASPIS*, Hook. f.

(*Pozoopsis*, Hook. f.)

Calyx-teeth inconspicuous. Petals ovate, imbricate in the bud. Disk none besides the broad thick conical base of the styles. Fruit compressed from front to back, deeply furrowed on each side at the commissure. Carpels much flattened from front to back, the outer face flat with the dorsal rib in the centre, the lateral ribs bordering the narrow commissure in the centre of the convex inner face, the intermediate ribs forming the edges of the carpels. Vittæ none. Carpophore persistent. Seeds straight, flattened.—Perennials, with creeping rhizomes and dense tufts of radical leaves. Leaves cordate or orbicular, rather thick. Scapes simple with a terminal simple umbel of several often many flowers.

The genus is confined to Australia.

Glabrous. Leaves broadly ovate-cordate, quite entire. Flowers under 20 in the umbels.

1. *D. hydrocotylea*.

More or less hirsute with long hairs. Leaves orbicular-cordate distinctly crenate. Flowers numerous in the umbel.

2. *D. cordifolia*.

1. ***D. hydrocotylea***, Hook. f. in Hook. Lond. Journ. vi. 469, and Fl. Tasm. i. 156. t. 34. Perennial, with a creeping rhizome. Leaves radical, tufted, on rather long petioles, cordate, orbicular or ovate, thick with revolute margins, under $\frac{1}{2}$ in. and often not $\frac{1}{4}$ in. diameter, glabrous or sprinkled with a few hairs. Scapes 2 to 4 in. long, each with a single terminal umbel of 12 to 20 flowers on pedicels of 1 to 2 lines. Involucre of a few unequal linear bracts. Petals obtuse.

Victoria. Haidinger range, Bogong and Upper-Mitta-Mitta mountains, F. Mueller.

Tasmania. Marshes and wet sandy ground about alpine lakes, J. D. Hooker.

2. ***D. cordifolia***, Hook. f. Fl. Tasm. i. 157. Very near *D. hydrocotylea*, but rather larger, more or less hirsute with spreading hairs, the revolute margins of the leaves distinctly crenate, the flowers much more numerous in the umbels, and the fruits considerably narrower.—*Pozoopsis cordifolia*, Hook. f. in Hook. Ic. Pl. t. 859.

Tasmania. Marshy places Mount Sorrel, Macquarrie Harbour, Gunn, Milligan; Mount Lapeyrouse, C. Stuart.





7. ACTINOTUS, Labill.

(Eriocalia, Sm.; Holotome, Endl.; Hemiphues, Hook. f.)

Calyx-limb distinct, campanulate or open, truncate or 5-lobed. Petals 5, unguiculate, spatulate or orbicular-emarginate, imbricate in the bud, or none. Disk-lobes or glands at the back of the styles, often not quite at the base. Ovary with a single cell and ovule; styles 2, often united at the base. Fruit ovate, of a single carpel, crowned by the calyx-limb, compressed from front to back, 5-ribbed, one face (the broad commissure?) nearly flat with 1 rib, the other (the back?) convex with 2 ribs, and 1 rib at or near each margin. Vitte none. Seed filling the cavity.—Herbs either annual or with a perennial root stock or woody or tufted base. Leaves toothed or ternately divided. Umbels simple, surrounded by a radiating involucre of herbaceous or coloured and often very tomentose or woolly bracts exceeding the flowers. Flowers often very numerous, all with apparently perfect stamens and styles, but the outer ones often males by the abortion of the ovary, rarely all perfect.

The genus is confined to Australia. The characters upon which it has been divided appear to me to be too artificial and too little in correlation with each other to serve even for sections.

Stems branched, more or less leafy. Umbels pedunculate.

Involucres very woolly or hirsute, coloured, 1 to 3 in. diameter.

Tall erect plants. Leaves once or twice tripartite.

Densely tomentose. Calyx 5-lobed. Petals none. 1. *A. Helianthi*.

Silky-hairy. Calyx truncate. Petals present 2. *A. leucoccephalus*.

Involucres under $\frac{1}{2}$ in. diameter. Stems culmose or ascending.

Leaves divided, white underneath. Calyx 5-lobed. Petals none 3. *A. minor*.

Leaves 3-toothed, glabrous. Calyx truncate. Petals present 4. *A. canifertilis*.

Leaves orbicular or rhomboid, toothed. Calyx 5-lobed. Petals present 5. *A. rhomboides*.

Stock densely tufted. Leaves and peduncles radical. Involucres under $\frac{1}{2}$ in. diameter, the bracts united at the base. Calyx 5-lobed.

Petals none (or present?) 6. *A. bellidioides*.

Stems leafy. Leaves divided with linear lobes. Umbels small, sessile. Calyx 5-toothed. Petals none 7. *A. glomeratus*.

1. *A. Helianthi*, Labill. Pl. Nov. Holl. i. 67. t. 92. Erect, apparently perennial, 1 to 2 ft. high, covered with a soft dense almost floccose or woolly tomentum, rarely wearing off from the upper side of the leaves. Leaves twice 3-partite, with linear or oblong-linear mostly obtuse segments, entire or again 2- or 3-lobed. Umbels dense, on long stout peduncles. Involucre radiating to a diameter of 2 or 3 in., consisting of 10 to 18 coloured softly tomentose bracts. Flowers on filiform pedicels of $1\frac{1}{2}$ to 2 lines, but so numerous as to form a dense head of $\frac{1}{2}$ in. to $\frac{3}{4}$ in. diameter, the outer ones all males, the central ones perfect, both in numerous rows. Calyx-limb hairy, transparent, about $\frac{1}{2}$ line long, deeply divided into obtuse linear lobes. Petals none. Disk-lobes oblong, gland-like, adnate to the entire base of the style. Fruit about 2 lines long, covered with long silky hairs.—Bot. Reg. t. 654; DC. Prod. iv. 83; *Eriocalia major*, Sm. Exot. Bot. ii. 37. t. 38.

Queensland. Moreton Bay, F. Mueller.

N. S. Wales. Port Jackson to the Blue Mountains, R. Brown, Sieber, n. 128, and others: New England, C. Stuart: on the upper Maracura, M. deCelt.

2. **A. leucocephalus**, *Benth. in Hury. Enum.* 56. Erect, dichotomously branched, more or less clothed with soft hairs, 1 to 2 ft. high. Radical leaves on long petioles, the others sessile, 3-partite, with linear or linear-cuneate segments, entire or again 3-partite or lobed. Umbels dense on long peduncles. Involucre expanding to 1 or 2 in. diameter, consisting of numerous lanceolate bracts, very densely covered with long silky hairs and twice as long as the flowers. Flowers very numerous, densely packed, but on short filiform pedicels, the males in several rows at the circumference, the central ones perfect. Calyx-limb small, campanulate, truncate, transparent, silky-hairy. Petals small, spatulate, on slender claws. Disk-lobes forming glands on the undivided base of the style. Fruits broad, above 1 line long, very silky-hairy.—*Hook. Ic. Pl.* t. 847; *Bunge in Pl. Preiss.* i. 292.

W. Australia. Swan River, *Decarville*, n. 28; Canning River, *Preiss*, n. 2656. Stirling ranges, *Maxwell*.

3. **A. minor**, *DC. Prod.* iv. 83. Stems from a perennial base, long and slender, diffuse or ascending, glabrous or slightly tomentose or rarely silky-hairy. Leaves small, on short petioles, 3-partite, with cuneate or linear segments usually 3 to 4 lines long, entire or 2- or 3-lobed, glabrous above, white tomentose underneath, rarely silky-hairy. Umbels small, on long slender peduncles. Involucre radiating to about $\frac{1}{2}$ in. diameter, the bracts lanceolate, acute, densely white-tomentose on the upper side, glabrous on the back, at least along the centre. Flowers very numerous, the males in several rows at the circumference, the perfect ones in the centre, all on short very hairy pedicels. Calyx-limb deeply divided into acute lobes. Petals none. Disk-lobes sessile, with the styles between them distinct from the base. Fruit about 1 line long, hairy.—*Ericcalia minor*, *Sm. Exot. Bot.* ii. 39. t. 79.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sachs*, &c., 127, and others; Kiama, *Harvey*; Illawarra, *Shepherd*.

4. **A. omnifertilis**, *F. Muell.* (as a *Hololoma*). Annual or with a tufted perennial base; stems ascending or erect, filiform, $\frac{1}{2}$ to 1 ft. high, usually glabrous. Leaves mostly radical, on long slender petioles, cuneate, acutely 3- to 5-toothed or lobed, rarely above $\frac{1}{2}$ in. long, glabrous in all our specimens. Stem leaves few and less lobed, the upper ones narrow and entire. Umbels small, on filiform peduncles. Involucre not above $\frac{1}{4}$ in. diameter, the bracts narrow, acute, glabrous on both sides or slightly silky inside at the base. Flowers 10 to 20 or rarely more, slightly silky-hairy, on very short pedicels, all apparently perfect, but a few of the outer ones more slender from the first and probably not ripening. Calyx-limb transparent, truncate. Petals orbicular, concave, unguiculate. Fruit but little more than $\frac{1}{2}$ line long.—*Hololoma omnifertilis*, *F. Muell. Fragm.* ii. 129.

W. Australia. King George's Sound, *Harvey*; Hay river, *Maxwell*.

5. **A. rhomboideus**, *Benth.* Stems diffuse, branched and shrubby at the base, afterwards erect or ascending to the height of 1 ft. or more, hirsute with long soft hairs mixed with a stellate tomentum. Leaves chiefly in the lower part of the stem, petiolate, nearly orbicular or rhomboidal, irregularly and acutely toothed, under 1 in. long, hairy when young, at length glabrous.

Peduncles long, in the upper almost leafless part of the stem, bearing each a small dense umbel, with an involucre of 6 to 10 or more linear-lanceolate hirsute bracts exceeding the flowers. Flowers numerous, all perfect, or the outer ones males, on short pedicels. Calyx-limb acutely 5-lobed, hirsute. Petals unguiculate, scarcely inflexed, the margins recurved in the upper part. Disk-lobes scarcely distinct from the conical base of the styles. Fruit hairy. —*Xanthosia rhomboidea*, Turcz. in Bull. Mosc. 1849, ii. 32.

W. Australia. *Drummond*, 4th Coll. n. 134. —The structure of the flower and fruit, as well as the inflorescence, are entirely those of *Actinotus*, not of *Xanthosia*.

6. **A. bellidioides**, *Benth.* A dwarf perennial, forming dense tufts more or less covered with long soft hairs. Leaves radical, obovate-spathulate or orbicular, entire or coarsely crenate, thick, under $\frac{1}{2}$ in. long, on a petiole usually shorter. Peduncles $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, bearing a small head or umbel. Involucre radiating to about 3 lines diameter, consisting of 6 to 10 bracts, united at the base or sometimes to half their length. Flowers 6 to 10 or rarely more, 1 or 2 of the outer ones sometimes barren. Calyx-limb deeply 5-lobed. Petals none (or sometimes linear?). Fruits about 1 line long. —*Hemiphysalis bellidioides*, Hook. f. in Hook. Lond. Journ. vi. 470, and Fl. Tasm. i. 158. t. 36; *H. affinis*, *H. tridentata*, and *H. suffocata*, Hook. f. in Hook. Lond. Journ. vi. 471.

Tasmania. Mount Zetigue, Recherche Bay, at an elevation of 4000 ft., *Green*.

7. **A. glomeratus**, *Benth.* Erect and more or less clothed with soft hairs, with wiry branches, about 6 to 8 in. high. Leaves solitary, or 2 or 3 from the same node, deeply 3-partite, with linear entire or 2- or 3-lobed segments shorter and scarcely broader than the petiole. Flowers almost sessile, in lateral or terminal clusters, surrounded by a few short linear very hairy bracts, several males with the perfect ones in the same clusters. Calyx-limb with 5 acuminate lobes. Petals none. Disk scarcely any in the males, the abortive style clavate and hairy, in the females 2 short styles on a large conical disk or base. Fruit about $1\frac{1}{2}$ lines long.

W. Australia. Swan River, *Drummond*, 1st Coll.; King George's Sound, *Oldfield*.

8. ERYNGIUM, Linn.

Calyx-lobes rigid, acute or pungent-pointed. Petals erect, with reduplicate or recurved margins and a long induplicate point, scarcely imbricate in the bud. Disk with a thick raised margin encircling the styles. Fruit obovoid or ovoid, scarcely compressed, the ribs inconspicuous, without vittæ. Carpophore deciduous.—Herbs with prickly leaves and involucre. Flowers in compact spikes or heads, with a bract under each flower, the outer ones and sometimes some of the inner ones much longer than the flowers, rigid and pungent-pointed. Calyx-tube covered with transparent, acuminate or obtuse, transparent, flat or vesicular scales.

The genus is spread over the greater part of the warm and temperate regions of the globe, the species most abundant and most varied in S. America. Of the four Australian species one is also in Chili, another extends to New Zealand, the remaining two appear to be endemic.

Leaves pinnately toothed, lobed, or divided, the radical ones narrow.

Point of the petals jagged or ciliate.

Flower-heads ovoid or globular.

Stems erect, or rarely shortly decumbent at the base 1. *E. rostratum*.

Stems prostrate, resembling stolons but not rooting 2. *E. vesiculosum*.

Flower-heads oblong or cylindrical 3. *E. plantagineum*.

Radical leaves obovate or oblong, toothed or lobed. Stem leaves

opposite, short, divaricately lobed. Stems dichotomous. Point

of the petals obtuse, entire 4. *E. expansum*.

1. ***E. rostratum***, *Cur. Ic. Pl.* vi. 35. *t.* 552. Stems erect, 1 to 2 ft. high, the lower branches sometimes alternate, but more frequently the branches 2, 3, or 4 together, with a peduncle in the fork. Radical leaves elongated, usually linear, pinnatifid, with entire or pinnatifid linear-pungent lobes, but sometimes the rachis broader-linear, and the lobes reduced to teeth, or the rachis very narrow with very few distant narrow lobes, or in wet places the leaves quite entire, grass-like, 6 in. long, and marked with raised transverse lines so as to appear jointed. Stem-leaves only under the peduncles or branches, short, once or twice pinnatifid, and very rigid and pungent. Flower-heads ovoid-globose. Bracts very rigid and pungent, linear or linear-lanceolate, the outer ones and sometimes a few of the inner ones $\frac{1}{2}$ to 1 in. long, the others smaller, and some not exceeding the flowers. Calyx-tube densely covered with linear obtuse scales or vesicles. Inflected point of the petals ciliate-denticulate or jagged.—DC. *Prod.* iv. 89; *E. ovium*, A. Cunn. in *Field*, N. S. Wales, 358; Schlecht. *Linnaea*, xx. 622; DC. *Prod.* iv. 89; *E. angustifolium*, DC. *Prod.* iv. 95 (from the diagnosis given); *E. pinnatifidum* and *E. tetracephalum*, Bunge in *Pl. Preiss.* i. 293.

N. S. Wales. Plains of Bathurst and all the grassy lands in the interior, *A. Cunninghamham*, *Fraser*.

Victoria. Common about Melbourne, *Adams*; Wendu valley, Gladg river, *Robertson*; Skipton plains, *Whan*.

S. Australia. Near Bethanie, *Behr*; Guichen Bay, Lofty Range, Torrens river, etc., *F. Mueller* and others.

W. Australia. Swan River and Darling Range, *Drummond*, 1st *Coll.* also n. 8, 23, 26; *Preiss.* n. 2053, 2054, and others; Canning, Vasse, Blackwood, and Tone rivers, *Oldfield*.

The species is found also in extratropical South America. It is exceedingly variable in size, number of heads, and degree of division of the leaves. In some vigorous specimens, the heads are $\frac{1}{2}$ in. or rather more in diameter, without the involucrel bracts, which are 1 to $1\frac{1}{2}$ in. long, and some of them with a few bristly lobes. In others the heads are few and small, and but few of the bracts attain $\frac{1}{2}$ in. In general, in arid situations the leaves are more divided with narrower more rigid lobes, and in wet situations either entire or simply pinnatifid.

Var. *subdecumbens*. Radical leaves 6 in. to 1 ft. long, linear, entire, or with a few linear lobes. Stems short, sometimes decumbent, almost as in *E. vesiculosum*.—W. Australia, *Drummond*, 3rd *Coll.* n. 230; Tweed river, *Oldfield*.

2. ***E. vesiculosum***, *Labill. Pl. Nov. Holl.* i. 73. *t.* 98. Radical leaves lanceolate, oblanceolate, oblong or broadly linear, coarsely prickly-toothed, narrowed into a petiole, rarely above 3 or 4 in. long and usually much shorter. Stems elongated, prostrate, having the appearance of stolons, but not rooting. Floral leaves opposite, cuneate or linear, mostly $\frac{1}{2}$ to 1 in. long, with 3 to 5 pungent teeth or lobes. Peduncles radical or from the

nodes, each with a small hemispherical globular or shortly ovoid head. Outer bracts and sometimes a few of the inner ones linear or lanceolate, rigid, pungent and far exceeding the flowers, the others much smaller. Scales or vesicles of the calyx-tube sometimes lanceolate and acute, sometimes oblong and obtuse. Petals with the inflexed points slightly jagged.—DC. Prod. iv. 92; Hook. f. Fl. Tasm. i. 159.

N. S. Wales. Port Jackson, *Clowes*; New England, *C. Stuart*.

Victoria. Near Melbourne, *Adams*; Wendi valley, Glenelg river, *R. L. A.*; Portland, *Allitt*; Skipton, *Whan*.

Tasmania, *R. Brown*: marshy places in the northern and central parts of the island, *J. D. Hooker*.

S. Australia. Near Bethanie, Gawler river, Encounter Bay, *F. Mueller*.

The species is also in New Zealand.

3. ***E. plantagineum***, *F. Muell. in Proc. Roy. Soc. Tasm.* iii. 235. Very closely allied to *E. rostratum*, with the same habit, foliage, and flowers, but the heads are oblong-cylindrical, and the bracts smaller, a few only of the outer ones and very rarely 1 or 2 of the upper ones projecting far beyond the flowers.

Queensland, *R. Brown*; Peak Downs, *F. Mueller*; tributaries of the Upper Darling river (*Leichhardt*?).

S. Australia. Flooded ground S. of Wills Creek, *Allitt's Expedition*.

4. ***E. expansum***, *F. Muell. in Proc. Roy. Soc. Tasm.* iii. 236. Radical leaves oblong or almost obovate, 2 to 3 in. long, narrowed into a petiole, bordered by coarse prickly teeth or lobes. Stems erect or diffuse, dichotomous, extending to 1 or 2 ft. Floral leaves opposite, short and broad, deeply divided into 3 or rarely 5 divaricate cuneate prickly-toothed lobes. Peduncles in the forks very short, each with a small globular head of 6 to 8 or rarely more small flowers. Bracts linear or lanceolate, pungent, all at least the outer ones much longer than the flowers. Flowers scarcely 1 line long, including the ovary. Calyx-lobes shorter than the adnate tube (or ovary), pungent-pointed as in the rest of the genus. Petals very short, the inflexed end obtuse, entire.—*Klatt in Linnaea*, xxix. 712.

Queensland. Dawson and Burnett rivers and Peak Downs, *F. Mueller*; Wide Bay, *Leichhardt*; Brisbane river, Moreton Bay, *Leichhardt*, *C. Stuart*.

N. S. Wales. Hunter's River, *R. Brown*.

The species has some resemblance to the tropical American *E. foliosum*, but it is remarkable for the smallness of its flowerheads.

9. **APIUM**, Linn.

Calyx-teeth inconspicuous. Petals ovate or broad, with a short inflexed tip, the margins not recurved, scarcely imbricate. Disk rather thick, confluent with the conical base of the styles. Fruit short, slightly compressed laterally. Carpels ovoid, with 5 prominent ribs, the lateral ones close to the rather narrow commissure, with 1 vitta under each furrow, and usually 2 at the commissure. Carpophore undivided. Seed nearly terete, straight.—Erect or prostrate herbs. Leaves ternately or pinnately dissected. Umbels compound, leaf-opposed or terminal, without involueral bracts.

The genus, whether limited to three or four species, or further extended to include several

species distinguished upon slight grounds by modern botanists, will be found to extend over most of the temperate and warmer regions of the globe. Both the Australian species have a wide range, one chiefly in the southern hemisphere without the tropics, the other in America and tropical Africa.

Leaves once or twice pinnate, with 3 or 5 more or less divided broad or

narrow segments 1. *A. australe*.

Leaves ternately divided into numerous filiform segments or lobes . . . 2. *A. leptophyllum*.

1. *A. australe*, *Thou.*; *Hook. f. Fl. Tasm.* i. 160. Stems usually prostrate or decumbent, rarely erect, from very short to 1 or 2 ft. long, or even more. Leaves once or twice pinnatipartite, very variable in size and shape, the segments 2-partite, with incised lobes, from broadly obovate to narrow-linear, the lower ones on rather long petiolules. Umbels sessile or very shortly pedunculate at the nodes, of from 3 to 6 rays, each with a small umbel of rather numerous white flowers, without involueral bracts. Disk broad and thick, almost flat. Carpels with the primary ribs very prominent, almost corky, and narrow furrows between them; vittæ usually broad, but not very distinct. — *A. prostratum*, Labill. Pl. Nov. Holl. i. 76. t. 103; Vent. Jard. Malm. t. 81; *Petroselinum prostratum*, DC. Prod. iv. 102; *Hook. Ic. Pl.* t. 305; *Helosciadium australe*, Bunge in Pl. Preiss. i. 294; *H. prostratum*, Bunge, l. c. 295.

Queensland. Port Curtis, *McGillivray*; Brisbane river, Moreton Bay, *F. Mueller*; Fitzroy river, *Thozet*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, n. 119, and others; northward to Hastings river, *Fraser*; Clarence river, *Wilcox*; southward to Two-fold Bay, *F. Mueller*; Lord Howe's Island, *McGillivray*.

Victoria. From the Glenelg to Gipps' Land, *F. Mueller* and others; Wimmera, *Dallachy*.

Tasmania. Islands of Bass's Straits, *R. Brown*; common, especially on the northern shores of the island, *J. D. Hooker*.

S. Australia. From the Murray river to Spencer's and St. Vincent's Gulls, *F. Mueller*, and others.

W. Australia. From the S. coast to Swan and Murchison rivers, *Diamond*, 1st Coll., also n. 65, 124, 141, and 293, *Preiss*, n. 2051, 2052, *Oldfield*.

There are two common forms, one with short broad very obtuse leaf-segments, chiefly found near the sea; and some specimens from the seacoast of Tasmania, the islands of Bass's Straits and adjoining coasts of the mainland, have a thick almost woody stem and large thick leaves divided into very numerous small obtuse segments. The other form has numerous long narrow acute linear segments, and often seems too unlike the maritime one to belong to the same species, but the intermediates between the two are very numerous, passing gradually from the one to the other.

The species is also in New Zealand, the S. Pacific islands, Antarctic America, and perhaps in South Africa. It is very near the wild celery of the northern hemisphere (*A. graveolens*, Linn.), but that has generally an erect stem, and the ribs of the fruit appear to be always much more slender, with broad furrows between them.

2. *A. leptophyllum*, *F. Muell. Herb.* An erect or diffuse slender glabrous annual of 1 to 2 ft. Leaves ternately divided into numerous filiform segments, the lower ones petiolate, the upper ones sessile, with fewer segments. Umbels at the nodes sessile or pedunculate, of 2 or 3 slender rays, each with a partial umbel of many flowers on slender pedicels, without involueral bracts. Disk rather broad, convex, scarcely distinct from the very short styles. Ribs of the carpels very prominent and thick, almost corky, separated by very narrow furrows, with one vitta under each furrow.—

Helosciadium leptophyllum, DC. Prodr. iv. 105, with the numerous synonyms adduced.

Queensland. Brisbane river, Moreton Bay, *F. Mueller*.

N. S. Wales. Port Jackson, *Sieber*, n. 481, *Beckhous*; Clarence river, *Beckler*.

The species is common in South America, extending to the Southern States of North America, and is also found in tropical Africa.

10. **SESELI**, Linn.

Calyx-teeth usually prominent. Petals in the Australian species ovate, tapering into an inflexed point, the margins not recurved. Disk thick, surrounding the base of the style or confluent with it. Fruit ovoid or oblong, not compressed. Carpels with 5 prominent ribs, the lateral ones close to the broad commissure, with 1 vitta under each furrow, and usually 2 to the commissure. Carpophore divided or nearly entire. Seed semiterete, straight.—Herbs, in the Australian species, glabrous, with a perennial stock. Leaves chiefly radical, once or twice pinnately dissected. Umbels terminal, compound. Involucral bracts few. Flowers white.

The genus comprises a considerable number of species, inhabitants of the northern Hemisphere in the Old World. The Australian species are both endemic, and though differing in some slight particulars will probably prove to be really congeners of the northern ones.

Leaf-segments narrow. Fruit narrow-oblong, 3 to 4 lines long . . . 1. *S. Harveyanus*.
 Leaf-segments short and broad. Fruit shortly oblong, under 2 lines . . . 2. *S. algens*.

1. **S. Harveyanus**, *F. Muell. in Hook. Kew Jour.* viii. 71, and in *Trans. Phil. Inst. Vict.* i. 104. Stems from a thick perennial rootstock, erect, glabrous as well as the whole plant, 1 to 1½ ft. high. Leaves chiefly radical, sometimes as long as the stem, on long petioles, pinnately divided, with linear or linear-lanceolate segments often ½ in. long, the lower ones of each leaf often again 3-partite or shortly pinnate; upper leaves few, narrow, simply pinnate or simple. Umbels terminal, of 4 to 7 very unequal rays, each partial umbel with 1 to 4 perfect flowers on long pedicels, and several small males on short pedicels. Involucres, both general and partial, of 2 or 3 very small bracts. Calyx-teeth prominent, unequal. Disk-lobes thick, surrounding the base of the styles. Fruit narrow-oblong, 3 to 4 lines long; carpels with 5 equally prominent ribs, the furrows rather broad, with 1 vitta under each and 2 at the commissure.—Klatt in *Linnaea*, xxix. 715.

Victoria. Alpine and subalpine pastures, from the Cobberas to the Muryong mountains, *F. Mueller*.

2. **S. algens**, *F. Muell. in Hook. Kew Jour.* viii. 71, and in *Trans. Phil. Inst. Vict.* i. 104. Quite glabrous. Stems from a thick perennial rootstock, short, decumbent or ascending. Leaves chiefly radical, simply pinnate, with broad rhomboidal obovate or cuneate segments deeply and acutely toothed or incised, mostly under ½ in. long; stem leaves few, the sheathing bases of the petioles long and broad. Umbels of 4 to 6 unequal rays. Involucres, both general and partial, of 2 or 3 narrow bracts. Calyx-teeth scarcely conspicuous. Disk-lobes confluent with the conical base of the styles. Fruit (not seen ripe) very shortly oblong, each carpel with 5 very prominent ribs.—Klatt in *Linnaea*, xxix. 716.

Victoria. Gravelly borders of alpine rivulets and springs, in the Munyong mountains, *F. Mueller.*

11. CRANTZIA, Nutt.

Calyx-teeth shortly prominent. Petals acute, concave, the margins not recurved, imbricate in the bud. Disk scarcely distinct from the conical base of the styles. Fruit broadly ovoid, very slightly laterally compressed. Carpels nearly terete, with 5 corky ribs, the lateral ones forming a thick mass at the rather broad commissure, with 1 vitta under each furrow and 2 at the commissure. Carpophore not separating from the carpels. Albumen of the seed terete.—Small creeping herb. Leaves linear-terete, undivided. Umbels simple, with minute involucrel bracts.

The genus is confined to a single species, extending to New Zealand and extratropical and Andine America.

1. **C. lineata**, *Nutt. Gen. Pl. N. Amer.* i. 175. Stems or rhizomes slender creeping and rooting at the nodes. Leaves solitary or tufted at the nodes, slender, fistulose, marked with transverse nodes, from under 1 in. in some specimens to 2 or 3 in. long, or even more, rarely in American specimens broader and flattened at the upper end. Peduncles filiform, solitary at the nodes, each with an umbel of 8 to 12 or sometimes more minute flowers, on pedicels of 1 to 2 lines. Fruits very small.—DC. *Prod.* iv. 71; Hook. f. *Fl. Tasm.* i. 160, and *Fl. Antaret.* 287. t. 100; Wedd. *Chlor. And.* ii t. 68.—*C. australica*, *F. Muell.* 2nd Gen. Rep. according to Klatt, *Linnaea*, xxix. 714.

Queensland. Brisbane river, *Mrs. Dietrich.*

N. S. Wales. Twofold Bay, *F. Mueller.*

Victoria. Mouth of Snowy River, Yarra river, *F. Mueller*; Barwan river, *Oldfield.*

Tasmania. Islands of Bass's Straits, *R. Brown*; marshes near Launceston, etc., *J. D. Hooker.*

S. Australia. St. Vincent's Gulf, *F. Mueller.*

12. ACIPHYLLA, Forst.

Calyx-teeth more or less prominent. Petals ovate or lanceolate, often inflexed at the tip but not acuminate, the margins not recurved, imbricate in the bud. Disk in the perfect flowers continuous with the conical base of the styles, in the males of 2 thick lobes without styles. Fruit (in the normal species) oblong, somewhat dorsally compressed; carpels dorsally compressed, with 5 (rarely 4 or 3) acutely prominent ribs, the lateral ones bordering the broad commissure and expanded into narrow wings, or at least twice as broad as the other 3, of which 1 or 2 are sometimes wanting; vittae 1 (or 2) under each furrow, often obscure. Carpophore bipartite.—Glabrous perennials, the true species rigid and erect. Leaves pinnately decomposed or reduced to a simple petiole. Umbels compound. Involucres of linear bracts. Flowers polygamo-dioecious, the male plants without intermixture of perfect ones, but some males often intermixed in the umbels of perfect flowers.

The genus extends to New Zealand and the Antarctic islands. *F. Mueller* proposes to include in it the whole of the species published by *J. D. Hooker* as *Anisolome*, and to adopt *Forster's* name of *Gisgildium* for the collective genus, or to reduce it altogether to *Ligu-*

ticum. But Hooker has now shown (Handb. N. Zeal. II.) that Forster's *Gingidium* belongs rather to *Angelica*, and the true *Aciphylla* appear to me to form as natural and well characterized a genus as the majority of those now adopted in *Umbellifere*. Whether those *Anisotomes*, now reduced by Hooker to *Ligusticum*, ought really to be regarded as congeners of the northern species can only be determined by a careful comparison of the numerous allied genera in the northern hemisphere.

Rigid erect plants. Fruits oblong, the lateral ribs or wings twice as broad as the others.

Leaves all reduced to long simple apparently articulate petioles . . . 1. *A. simplicifolia*.

Leaves dissected with linear segments. 2. *A. glacialis*.

Small densely tufted or procumbent plant. Fruits ovoid, the ribs all equal. Leaves dissected 3. *A. procumbens*.

1. ***A. simplicifolia***, *F. Muell.* (as a *Gingidium*). Stems from a densely tufted stock erect, rigid, 1 to 2 ft. high, with a short linear leaf or bract under each branch. Leaves otherwise radical, narrow-linear, 6 in. to 1 ft. long, obtuse, terete or flattened towards the end, striate and marked with transverse raised lines, giving them an articulate appearance, undivided, with broad sheathing bases. Umbel on the main stem of 8 to 10 or more unequal rays, those on the lateral branches smaller. General involucre of 3 or 4 unequal linear bracts, shorter than the rays, the partial ones of more numerous bracts. Petals rather narrow, scarcely pointed. Fruit oblong, 4 to 5 lines long, the carpels dorsally flattened, the ribs all acutely prominent, but the lateral ones twice as broad as the others and almost winged. Vittæ often very obscure.—*Gingidium simplicifolium*, *F. Muell.* in Trans. Phil. Inst. Vict. i. 104, Pl. Vict. t. 27, and in Hook. Kew Journ. viii. 72.

Victoria. Moist grassy subalpine pastures from Mount Wellington to the Muuyong mountains, *F. Mueller*.

2. ***A. glacialis***, *F. Muell.* (as a *Gingidium*). Stems from a densely tufted stock erect, rigid, 1 to 2 ft. high. Leaves chiefly radical, once or twice pinnate, the rachis thick, striate, marked at the divisions with transverse raised lines giving it an articulate appearance, broadly sheathing at the base; segments linear, entire. Umbels of several often very unequal rays. Bracts of the general involucre linear-lanceolate, shorter than the rays, of the partial involucre small and narrow. Petals ovate. Fruit oblong, 4 to 5 lines long, the carpels dorsally compressed, the ribs all acutely prominent, the lateral ones much more so than the others but less winged than in *A. simplicifolia*. Vittæ often obscure.—*Gingidium glaciale*, *F. Muell.* in Trans. Phil. Inst. Vict. i. 104, and in Hook. Kew Journ. viii. 71.

Victoria. Higher regions of the Australian Alps, at an elevation of 5 to 7000 ft., *F. Mueller*.

3. ***A. (?) procumbens***, *F. Muell.* (as a *Gingidium*). A small plant forming short dense tufts or emitting prostrate branches of 2 to 3 in., thickly covered with the membranous imbricated sheaths of old leaves. Leaves twice pinnate, with short crowded linear segments, acute and tipped with a hair-like point. Flowering-stems scarcely 1 in. high, with a single compound umbel of many rays. Involucral bracts few, lanceolate or linear, with scarious edges. Calyx-teeth half as long as the petals. Petals ovate or lanceolate. Fruit ovoid, about $1\frac{1}{2}$ lines long, the ribs all very acutely prominent and almost winged, equal or irregularly unequal. Vittæ ob-

seure.—*Gnagidium procumbens*, F. Muell. Fragin. i. 15; Hook. f. Fl. Tasm. ii. 363.

Tasmania. Summit of Mount Lapeyrouse, *Oldfield*.

This differs from the other species in its short equally-ribbed fruits, and comes very near to those which J. D. Hooker now reduces to *Ligusticum*, but differs from the northern species of that genus in the want of the numerous vittæ. The habit is that of some northern species of *Meum* or *Gaya*.

13. DAUCUS, Linn.

Calyx-teeth prominent. Petals with inflexed points, the margins not recurved, slightly imbricate in the bud. Disk small, confluent with the conical base of the styles. Fruit ovoid or oblong, scarcely compressed, bristly; carpels dorsally compressed, the primary ribs inconspicuous or not prominent, the 4 secondary ribs very prominent, expanded into rows of glochidiate bristles, with 1 vitta under each secondary rib and 2 at the broad commissure. Carpophore simple or bipartite.—Annuals or biennials, usually hirsute. Leaves decomposed, with narrow segments. Umbels compound, the bracts of the general involucre usually dissected.

Besides the Australian species, which extends over New Zealand and Western America, the genus includes the Carrot and a few other species natives of the northern hemisphere.

1. **D. brachiatus**, *Sieb. in DC. Prod.* iv. 214. An erect or decumbent annual, sometimes small and slender, sometimes stout and attaining 1 to 2 ft., more or less sprinkled or hirsute with short stiff hairs. Leaves on slender petioles, twice pinnate, with short narrow incised or pinnate segments, usually minutely mucronulate. Umbels of about 3 to 5 very unequal rays, with 2 or 3 floral leaves or involueral bracts divided into 2 or 3 linear-subulate segments; one of the rays sometimes growing out into a continuation of the stem and bearing another compound umbel. Fruit ovoid, varying very much in size, usually scarcely 2 lines long, with short bristles, sometimes above 3 lines long, the bristles long and very fine, or stout and dilated at the base.—Bunge in *Pl. Preiss.* i. 295; Hook. f. Fl. Tasm. i. 161, with the synonyms adduced (except *D. pusillus*, Mich.); *Scandix glochidiata*, Labill. *Pl. Nov. Holl.* i. 75. t. 102.

Queensland, *Boorman*; Moreton Bay, *F. Mueller*; near Warwick, *Beckler*; in the interior, *Mitchell*.

N. S. Wales. Port Jackson to the Blue Mountains, *Sieber*, n. 115, *A. Cunningham*, and others; Macleay river, *Beckler*; New England, *C. Stuart*; Darling and Lachlan rivers, *A. Cunningham*, and southward to Twofold Bay, *F. Mueller*.

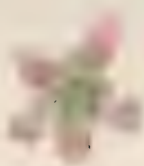
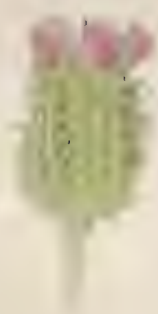
Victoria. Murray river, *F. Mueller*; Wimmera, *Dallachy*; Creswick, *Whom*; Portland, *Allitt*.

Tasmania. Common in the northern parts of the island, *J. D. Hooker*.

S. Australia. From the Murray river to St. Vincent's and Spencer's Gulfs, *F. Mueller* and others.

W. Australia. King George's Sound, *R. Brown*, and thence to Swan River, *Drummond*, 1st Coll.; *Preiss*, n. 2071, 2073; *Oldfield*; *Collie*.

J. D. Hooker includes among the synonyms of this species the *Daucus pusillus*, Mich., of the United States of N. America, and on that authority F. Mueller takes Michaux's name as the oldest for the species. *D. pusillus* appears however always to have the umbel, although small, regular with numerous rays, and more dissected involueral bracts, as in *D. Carota*, and must probably be retained as a distinct species connecting in some measure *D. brachiatus* with *D. Carota*.



Flaccida rosea, L.

183 per. super. comp. 183

D. Carota, Linn., the *wild carrot*, a tall erect plant, the umbels rather large with numerous crowded rays and the bracts of both involucre pinnatifid, is amongst the plants introduced from Europe and more or less established in waste places near settlements in Victoria and S. Australia.

14. OREOMYRRHIS, Endl.

(*Caldasia*, Lag.)

Calyx-teeth inconspicuous. Petals slightly concave, with short inflexed points, the margins not recurved, imbricate in the bud. Disk rather broad, continuous with the base of the styles. Fruit oblong or narrow, usually tapering towards the end, slightly compressed laterally; carpels nearly terete, with 5 obtusely prominent ribs, the lateral ones close to the rather broad commissure, with 1 vitta under each furrow and usually 2 at the commissure. Seed nearly terete, but longitudinally furrowed towards the commissure.—Perennial tufted herbs. Leaves pinnately dissected. Umbels simple, pedunculate. Involucral bracts ovate or lanceolate.

The genus consists apparently of a very few species, of which the Australian one has the widest range, extending over Antarctic and Andine America as well as New Zealand. The furrow of the albumen, although not deep, is distinct in all the seeds I have examined, and the habit appears to me to be very much that of several *Scandiacinae*. The genus is indeed very nearly allied to *Charophyllum*.

1. **O. andicola**, Endl.; *Hook. f. Fl. Ant.* ii. 288. t. 101. A densely tufted perennial, sometimes with only radical leaves and simple scapes, sometimes producing erect or ascending sparingly branched stems of 1 ft. or more, always more or less pubescent or hirsute. Leaves once twice or three times pinnately divided, the segments short and sessile, the ultimate lobes short, from linear-subulate to oblong, mostly acute. Peduncles usually erect from the stock, from 2 or 3 in. to 1 ft. or even near 2 ft. long, bearing each a single simple umbel, or sometimes a tuft of leaves and peduncles forming an irregularly compound leafy umbel. Flowers numerous, at first nearly sessile within the involucre of about 6 to 10 ovate or lanceolate entire or toothed leafy bracts; fruiting pedicels longer than the bracts, often growing out to 2 lines or more. Fruit usually narrow-oblong, 2 to 3 lines long, tapering at the top, but sometimes almost ovoid, and scarcely 2 lines long, and in one Victorian specimen (perhaps in an abnormal state) the unripe fruits are cylindrical and nearly 5 lines long.—Wedd. *Chlor. And.* ii. 206; *Caldasia andicola*, Lag.; DC. *Prod.* iv. 229; *Myrrhis andicola*, H. B. and K. *Nov. Gen. et Sp.* v. 13. t. 419; *Caldasia eriopoda*, DC. *Prod.* iv. 229; *Oreomyrrhis eriopoda*, Hook. f. *Fl. Tasm.* i. 162; *O. argentea*, Hook. f. in Hook. *lc.* t. 300, and *Fl. Tasm.* i. 162 (very hirsute with silky silvery hairs); *O. brachycarpa*, Hook. f. in Hook. *lc.* under n. 300, and *Fl. Tasm.* i. 162 (with short fruits); *O. sessiliflora* and *O. ciliata*, Hook. f. in Hook. *Lond. Journ.* vi. 471, and *Fl. Tasm.* i. 162, 163.

N. S. Wales. Clarence river, *Beckler*.

Victoria. Grassy places in the mountain districts, *F. Mueller*, and others.

Tasmania. Port Dalrymple, *R. Brown*. Common in grassy pastures both in the mountains and plains, *J. D. Hooker*.

The species is also in New Zealand and in Antarctic and Andine America. The several forms described by J. D. Hooker, which appeared distinct enough in numerous specimens originally transmitted from Tasmania, are by no means well marked out in more extensive

collections, the most striking are the *O. argentea* and *O. brachycarpa*, but the dense silvery hairs of the former occur in a greater or less degree in several Victorian as well as Andine specimens, and the comparative length of the fruit appears to be exceedingly inconstant.

ORDER LVII. ARALIACEÆ.

Calyx-tube adnate to the ovary; limb forming a slightly raised line or short cup round the summit, truncate or toothed, or quite inconspicuous. Petals 5 or more, or rarely 4, usually valvate and shortly inflexed at the tip, and often cohering, rarely with a long inflexed point, or (in a few species not Australian) obtuse and imbricate, inserted round an epigynous entire disk. Stamens as many as petals or sometimes (in genera not Australian) more, inserted with them round the epigynous disk; anthers versatile, with parallel cells opening longitudinally. Ovary inferior, 2- or more-celled, or very rarely 1-celled by abortion, with 1 anatropous ovule in each cell, pendulous from the summit. Styles as many as cells, either distinct erect and afterwards recurved with small terminal stigmas, or united in a cone, or reduced to a slight protuberance with as many stigmas as cells radiating on the summit and often scarcely conspicuous. Fruit more or less drupaceous and indehiscent, the epicarp succulent, rarely nearly dry and thin, always distinct from the endocarp, which is hardened into as many one-seeded pyrenes as cells of the ovary, usually laterally compressed. Seed pendulous, testa very thin, albumen the shape of the pyrene, with an even surface, or rarely ruminate. Embryo minute, near the apex of the seed, the radicle superior.—Trees, shrubs, or woody climbers, very rarely (in a few species not Australian) herbs. Leaves simple, digitate or pinnately compound, sometimes very large, the rachis often articulate, the petiole dilated at the base or the dilatations united in an intrapetiolar stipule. Flowers small, often greenish or purple, in umbels heads or rarely racemes, which are usually disposed in large terminal racemes or panicles, the umbels rarely solitary or in compound umbels. Bracts usually small and often inconspicuous or none. Flowers frequently polygamous, the ovary entirely abortive in the males, the stamens often smaller or rarely wanting in the females.

With the exception of a very few species in the temperate regions of the northern and southern hemispheres, the Order is confined to the tropics in the New as well as in the Old World. Of the six Australian species, two are widely spread over tropical Asia and Africa, one of them extending also to New Zealand; one extends only to the Indian Archipelago and the islands of the South Pacific; one, *Hodera*, has as yet only one ascertained occurrence, spread over the temperate regions of the northern hemisphere in the Old World; the remaining two are endemic.

Generally speaking, *Araliaceæ* differ from *Umbelliferae* by their tall shubby or arborescent habit, large leaves, paniculate inflorescence, valvate petals, entire disk and drupaceous fruits, but every one of these characters breaks down in some exceptional case, and some have proposed to unite the two Orders. But such connecting links occur in the case of even the most natural Orders, and it appears to me that if *Astrotrophe* and *Horsfieldia* are transferred from *Umbelliferae*, where they have been hitherto placed, into *Araliaceæ*, there is really very little difficulty in drawing the line of demarcation between the two.

Styles 2 (or exceptionally 3) distinct.

Petals with the tips slightly or not at all inflexed. Umbels heads
or racemes paniculate, rarely solitary.

Leaves all simple. Plant densely stellate-tomentose 1. *ASTROTROPHE*.

Leaves mostly or all compound. Plant glabrous or nearly so . . . 2. *PANAX*.



- Petals narrow, with long induplicate points. Umbels twice or thrice compound. Leaves digitate 3. MACKINLAYA.
- Styles united in a cone or short style, or reduced to a short protuberance in the disk. Ovary several-celled.
- Ovary-cells and pyrenes 5 to 7. Flowers pedicellate, without bracteoles.
- Albumen ruminatè 4. HEDERA.
- Albumen even 5. HEPTAPLEURUM.
- Ovary-cells and pyrenes 7 to 16. Flowers closely sessile within 4 short broad bracts, forming small heads arranged in long racemes 6. BRASSAIA.

1. **ASTROTICHE, DC.**

Calyx-teeth minutely prominent. Petals 5, valvate, usually pubescent outside. Stamens 5. Disk broad and not thick, the margin often prominent. Ovary 2-celled. Styles 2, distinct, at first erect, afterwards recurved. Fruit flattened or thick, the endocarp hardened into 2 pyrenes, furrowed on each side of the commissural edge or curved into spurious empty cells, the endocarp quite distinct as in other *Araliaceæ*, but not so succulent. Albumen even.—Shrubs more or less clothed with a stellate tomentum. Leaves petiolate, undivided, entire. Umbels pedunculate, in large terminal panicles. Flowers articulate on the pedicel.

The genus is limited to Australia. It is usually placed in *Umbellifera*, but the structure of the flowers and fruit, as well as the habit, are much nearer those of *Panax*, from which the genus differs slightly in the epicarp rather drier, in the foliage and the stellate tomentum.

- Fruit thick, with narrow wings on each side. Endocarp curved into spurious cells on each side of the inner angle of the pyrene. Leaves cordate-lanceolate 1. *A. pterocarpa*.
- Fruit flat. Endocarp grooved only on each side of the inner angle of pyrene.
- Leaves from ovate-lanceolate to narrow-lanceolate 2. *A. floccosa*.
- Leaves linear-lanceolate, acute, mostly 3 to 6 in. long. Calyx-teeth scarcely conspicuous 3. *A. longifolia*.
- Leaves from oblong-linear to narrow linear, obtuse, 1 to 3 in. long. Calyx-teeth prominent 4. *A. ledifolia*.

1. ***A. pterocarpa*, Benth.** A slender shrub (*W. Hill*). Leaves on long petioles, cordate-lanceolate, 6 to 10 in. long, densely floccose-tomentose on both sides as well as the leafy branches. Panicle very large, with narrow leafy bracts under the principal branches. Umbels dense, many-flowered, on short peduncles. Pedicels rarely longer than the flowers. Disk scarcely prominent. Fruits without the wings ovoid-oblong, thick, about 3 lines long, slightly furrowed; the endocarp forming 3 collateral cells in each carpel, the 2 lateral ones empty, the central one enclosing the seed; the epicarp expanded at the commissure into a rather broad wing, often not apparent till the fruit is quite ripe.

Queensland. Fitzroy Island, *W. Hill*.

2. ***A. floccosa*, DC. Mem. Ombell. 30. t. 5; Prod. iv. 74.** A shrub, attaining from 10 to 30 ft., the young branches inflorescence and under side of the leaves clothed with a dense floccose tomentum. Leaves from ovate-lanceolate to lanceolate, tapering into a narrow point, rounded at the base or

slightly cordate, the larger ones sometimes almost peltate, 4 to 8 in. long, glabrous on the upper side, the floral ones small, linear-lanceolate or the upper ones reduced to small bracts. Umbels numerous, many-flowered, in a large terminal panicle. Petals woolly-tomentose outside. Disk with a slightly raised margin. Fruit nearly 2 lines broad, flat, not winged, the endocarp of each carpel sometimes grooved or folded towards the commissure, but not curved into spurious cells.—*Bolax floccipes*, Sieb. Pl. Exs.

Queensland. Moreton Island, *F. Mueller*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, n. 258, and others; northward to Hastings river, *Beckler*; and New England, *C. Stuart*; southward to Illawarra, *A. Cunningham*, and others.

Var. *subpeltata*. Leaves more coriaceous, shining above, slightly cordate or shortly peltate at the base.—Blue Mountains, Illawarra, etc.

Var. *angustifolia*. Leaves lanceolate, about $\frac{1}{2}$ in. broad.—Blue Mountains and to the northward.

Var. *incana*. Tomentum closer and whiter. Panicle more slender and leafless. Flowers fewer and less tomentose.—*A. latifolia*, Benth. in *Hueg. Enum.* 55.—Port Jackson and Blue Mountains.

3. ***A. longifolia***, Benth. in *Hueg. Enum.* 55. Nearly allied to the narrow-leaved varieties of *A. floccosa*, but the leaves much narrower, the panicle more slender, with fewer flowers to the umbel and the calyx-teeth more prominent. Leaves linear-lanceolate, acuminate, 3 to 5 in. long and rarely above $\frac{1}{4}$ in. broad, glabrous above, with a close white or looser and floccose tomentum underneath, or rarely almost glabrous. Fruits rather larger than in *A. floccosa*.

Queensland. Brisbane river, Moreton Bay, *A. Cunningham*, *F. Mueller*, and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Lowes*; Port Stevens, *M. Arthur*.

Some specimens are very difficult to distinguish from the narrow-leaved ones of *A. floccosa*; others come near to the longer-leaved ones of *A. ledifolia*.

4. ***A. ledifolia***, DC. *Mem. Umbell.* 30. t. 6, and *Prod.* iv. 74. A more slender shrub than *A. floccosa*, with virgate branches covered as well as the inflorescence and under side of the leaves with a close or floccose tomentum. Leaves oblong-linear or narrow-linear, obtuse or rarely almost acute, 1 to 3 in. long, glabrous above, the margins recurved or revolute. Panicle smaller and narrower than in *A. floccosa*. Flowers and fruit the same as in that species.—*Bolax ledifolius*, Sieb. Pl. Exs.; *A. horeoides*, A. Cunn.; Benth. in *Hueg. Enum.* 55 (with short leaves); *A. linearis*, A. Cunn.; Benth. l. c. (with long narrow leaves); *A. asperifolia*, F. Muell.; Klatt in *Linnaea*, xxix. 709 (with long leaves).

N. S. Wales. Port Jackson to the Blue Mountains, *Sieber*, n. 257, and others; southward to Illawarra, *A. Cunningham*, and others.

Victoria. Buffalo range, Latrobe river, Grampians, etc., *F. Mueller* (usually the short-leaved form).

2. PANAX, Linn.

(*Nothopanax*, Miq.)

Calyx-border usually slightly prominent, truncate or shortly 5-toothed. Petals 5, valvate, often cohering at the tips, especially in female flowers. Stamens 5. Disk broad and not thick, the margin sometimes prominent.



Astrotrocha Hamptoni F.M. 1923

Ovary 2- or rarely 3-celled. Styles 2, rarely 3, at first erect and sometimes cohering, afterwards distinct and recurved. Fruit flattened, the endocarp hardened into 2 distinct pyrenes not furrowed, sometimes 2-ribbed on the dorsal edge, the exocarp more or less succulent. Albumen even.—Trees or shrubs. Leaves pinnately or digitately compound or rarely a few on the same tree or bush undivided. Flowers often polygamous, articulate on the pedicels, in umbels or rarely in heads or racemes, the umbels or racemes paniculate or rarely solitary.

The genus, if limited according to the views of Planchon and Decaisne, is widely distributed over the tropical regions of the Old World and extends to New Zealand, but is not American, and comprises Linneus's *P. fruticosum* and others. The northern herbaceous species of Linneus, with imbricate petals, are united by the same authors with *Aralia*, a course sanctioned by A. Gray and others. Miquel, however, reserves the name of *Panax* for these herbaceous species, and proposes the name of *Nothopanax* for Planchon and Decaisne's *Panax*. As the views of the latter authors will probably meet with more general adoption, they are here followed. The seven Australian species, as far as hitherto known, are all endemic, two of them anomalous in their inflorescence.

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|--|------------------------------|
| Leaves digitate or rarely undivided. Umbels solitary | 1. <i>P. Gunnii</i> . |
| Leaves pinnate or bipinnate. Flowers umbellate, umbels paniculate or racemose. | |
| Leaflets glabrous, long, obliquely lanceolate. Calyx-teeth scarcely prominent | 2. <i>P. Murrayi</i> . |
| Leaflets softly pubescent underneath, large, ovate or oblong, acuminate. Calyx-teeth scarcely prominent | 3. <i>P. mollis</i> . |
| Leaflets glabrous, large, ovate-lanceolate or oblong. Umbels few-flowered, numerous. Calyx-limb cup-shaped, truncate | 4. <i>P. Macgillivraei</i> . |
| Leaflets glabrous, mostly under 3 in., ovate-lanceolate or linear, entire toothed or dissected. Calyx-limb very short, sinuate-toothed | 5. <i>P. sanducifolius</i> . |
| Leaves 3-foliolate. Flowers sessile, capitate; heads paniculate or racemose | 6. <i>P. cephalobotrys</i> . |
| Leaves pinnate or bipinnate. Flowers pedicellate, racemose; racemes paniculate | 7. <i>P. elegans</i> . |

1. **P. Gunnii**, Hook. f. in Hook. Lond. Journ. vi. 466, and Fl. Tasm. i. 163. t. 37. A sparingly-branched shrub of 2 or 3 ft. with slender branches, more or less strigose with appressed hairs, as well as the petioles and sometimes the ribs of the leaflets. Leaves mostly digitate, with 5 or rarely 6 or 7 lanceolate segments of 1 to 2 in., coarsely serrate or pinnatifid, but on some branches the leaves reduced to 3 lanceolate segments or quite simple. Umbels terminal, solitary, on short peduncles. Flowers numerous, on pedicels of 1 or 2 lines. Calyx-teeth prominent. Disk slightly convex. Styles short. Fruit not seen ripe.

Tasmania. Towards Port Macquarrie, Franklin and Gordon rivers, Gunn, Milligan; near Mount Lapeyre, Oldfield, C. Stuart.

2. **P. Murrayi**, R. Muell. Fragm. ii. 106. A splendid tree, the trunk simple to the height of 50 or 60 ft., and then almost trichotomously branched (*P. Mueller*, Dallachy). Leaves simply pinnate, often several ft. long; leaflets obliquely lanceolate, entire or slightly denticulate, herbaceous but not thin, 3 to 6 in. long, or when luxuriant 8 to 10 in., quite glabrous. Umbels many-flowered, pedunculate, in racemes or divaricately-branched panicles. Calyx-teeth inconspicuous. Petals and stamens not seen. Fruit about 2

lines broad; the endocarp not very hard.—*Nothopanax Murrayi*, Seem. Fl. Vit. 114.

Queensland. Rockingham Bay, *Dallachy*.

N. S. Wales. Hastings river, *Beckler*; Twofold Bay, *F. Mueller*.

3. ***P. mollius*, Benth.** A tall shrub. Leaves simply (or doubly?) pinnate; leaflets ovate ovate-lanceolate or oblong, acuminate, 6 to 10 in. long, glabrous above, softly pubescent or villous underneath. Umbels many-flowered, numerous, in large divaricately-branched panicles, the rachis minutely tomentose. Calyx-teeth slightly and irregularly prominent. Styles long and slender. Fruit about 2 lines broad, but not seen quite ripe.

Queensland. Rockingham Bay, *Dallachy*.

4. ***P. Macgillivraei*, Benth.** A small tree of about 20 ft., quite glabrous. Leaves simply (or doubly?) pinnate, the rachis articulate; leaflets shortly petiolulate, oval-oblong or ovate-lanceolate, shortly acuminate, often oblique at the base, 6 to 10 in. long, thin and membranous in our specimens. Umbels few-flowered, in a large loose compound panicle with slender branches and pedicels. Calyx-limb prominently cup-shaped, truncate or slightly sinuate-toothed. Petals rather long and narrow. Fruits about 3 lines broad, very flat, the carpels often readily separating, each with a thin exocarp, and a flat smooth hard endocarp.—*Nothopanax Macgillivrayi*, Seem. Fl. Vit. 114.

Queensland. Cape York, *McGillivray*; Albany Island, *W. Hill*.

5. ***P. sambucifolius*, Sieb. in DC. Prod. iii. 255.** A tall shrub or tree, quite glabrous. Leaves simply or doubly pinnate; leaflets exceedingly variable, most commonly distant, petiolulate or sessile, ovate elliptical or lanceolate, $1\frac{1}{2}$ to 3 in. long, acute, entire, denticulate or lobed, the lowest of the simply pinnate leaf, or the lowest of each pinna often smaller, broader, and close to the base, but sometimes the leaflets divided, or narrow-linear and pinnatifid with divaricate distant lobes, the rachis sometimes dilated and as broad as the lobes. Umbels many-flowered in a terminal branched corymbose panicle or in a simple raceme. Calyx-limb shortly prominent, dilated, very shortly sinuate-toothed. Petals in the perfect flowers often cohering at the tips, smaller and more spreading in the males. Fruit 2 to 3 lines broad, with a white or lead-coloured succulent exocarp, the endocarps or pyrenes flat with 2 obtuse dorsal ribs.—*P. angustifolius* and *P. dendroides*, *F. Muell.* in Trans. Phil. Inst. Vict. i. 12, and Pl. Vict. i. 28; *Nothopanax sambucifolius*, Seem. Fl. Vit. 115.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*; *Sieber*, a. 256, and others; northward to Hastings, Macleay, and Clarence rivers, *Beckler*; and southward to Illawarra, *A. Cunningham*; Berrima, *Woolfs*; and Twofold Bay, *F. Mueller*.

Victoria. Mountains from Dandenong and Mount Macedon to the Buffalo range and a great part of Gipps' Land, *F. Mueller*.

Tasmania. Douglas river, E. coast, *Milligan*, according to *F. Mueller*, but the specimens are in leaf only, and appear to me to be somewhat doubtful.

The specimens with narrow much-dissected leaves are so very unlike the others or even any *Panax*, that *A. Cunningham* had distributed them under the name of *Trachymene pinnata*. The manner, however, in which the various forms of leaflets are combined, even on the same specimens, show that all belong to one species.

6. ***P. cephalobotrys*, F. Muell. Frugn. ii. 83.** Shrubby, somewhat



Canax gallalobatus Vol 3. p 302
F. v. 11



De Gruchy & Leigh imp

Macbrida macrocarpa F.M.

climbing, glabrous except the inflorescence, or the young branches and petioles sprinkled with a few appressed hairs. Leaves on long slender petioles, with 3 petiolulate leaflets, oblong or lanceolate, acuminate, 3 to 4 in. long. Flowers sessile, in small pedunculate heads, forming a simple raceme or a slender slightly-branched panicle scarcely exceeding the leaves. Petals and stamens not seen. Young fruit broadly ovate, compressed, crowned by the short cup-shaped, obtusely 5-lobed calyx-limb. Disk with the margin slightly prominent. Styles rather long.

N. S. Wales. Clarence and Richmond rivers, *Beckler*.

This and the following species differ from the rest of the genus in inflorescence, but the flowers and fruits appear to be otherwise entirely those of *Panax*.

7. **P. elegans**, *F. Muell. in Trans. Phil. Inst. Vict.* ii. 68. A large and handsome tree, glabrous except the inflorescence. Leaves large, simply or doubly pinnate, the rachis articulate. Leaflets petiolate, opposite, ovate, acuminate, entire, coriaceous, shining, often 3 to 4 in. long. Flowers singly pedicellate in little racemes, which are very numerous and arranged in a large terminal divaricately-branched panicle, the rachis minutely hoary-pubescent. Calyx-border shortly prominent, entire. Petals and styles of the genus. Disk not prominent. Fruits about 3 lines broad, the endocarp or pyrenes hard.—*Nothopanax elegans*, *Seem. Fl. Vit.* 114.

Queensland, *Burdekin Expedition*; Rockhampton and Edgewood Bay, *Dallachy*; Brisbane river, Moreton Bay, *A. Cunningham*, *F. Mueller*, *C. Moore*.

N. S. Wales. Clarence river, *Beckler*; Richmond river, *C. Moore*; Illawarra, *Eulston* (according to *F. Mueller*, the specimen in leaf only).

3. MACKINLAYA, *F. Muell.*

Calyx with 5 prominent lobes. Petals unguiculate, with long induplicate points, valvate in the bud. Stamens 5. Disk broad, the margin undulate. Ovary 2-celled. Styles 2, at first erect, afterwards recurved. Fruit very flat, the endocarp cartilaginous, forming 2 separate pyrenes, the exocarp succulent.—Shrub or tree. Leaves digitately compound. Flowers polygamous, articulate on the pedicels, in a large compound terminal umbel, with general and partial involucre of narrow bracts.

The genus is limited to a single species, endemic in Australia, differing from *Panax* chiefly in inflorescence and in the petals resembling those of many *Umbellifera*.

1. **M. macrosciadia**, *F. Muell. Fragm.* iv. 120. A slender shrub or small tree, quite glabrous. Leaves with the common petiole sheathing at the base, but without distinct stipules; leaflets 3 to 7, usually 5, petiolulate, ovate or oblong, shortly acuminate, entire or with a few coarse distant teeth, 4 to 8 in. long, membranous at least at the time of flowering. Umbels 3 times or even 4 times compound, with numerous rays, the primary ones often 4 or 5 in. long, the secondary and tertiary umbels compact. Involucre both general and partial of several linear or linear-lanceolate bracts, much shorter than the rays. Calyx-lobes acute or acuminate. Fruits when perfect about 7 lines broad and 5 lines long, but one carpel often deformed and semi-abortive.—*Panax macrosciadia*, *F. Muell. Fragm.* ii. 108, 176.

Queensland. E. coast, *R. Brown*, *A. Cunningham*; Dunk Island, *McGillivray*;

Fitzroy Island, *McGillivray, W. Hill*; Port Moller and Cumberland Islands, *Fildes*; Rockingham Bay, *Dallachy*.

4. *HEDERA*, Linn.

(*Irvingia*, *F. Muell.*; *Kissodendron*, *Seem.*)

(Calyx-border slightly prominent, entire or sinuate-toothed. Petals 5, valvate. Stamens 5. Disk convex, sometimes very prominent. Ovary 5-celled. Styles united into an obtuse cone or very short cylindrical style, with 5 scarcely prominent stigmas. Fruit nearly globular, with 5 1-seeded pyrenes. Seed with a furrowed or ruminated albumen.—Woody climbers or trees. Leaves entire, lobed or pinnately compound. Flowers umbellate, not articulate on the pedicel, the umbels pedunculate in terminal panicles.

The genus, characterized essentially by the ruminated albumen, contains besides the Australian species, which is endemic, one widely dispersed over the northern hemisphere in the Old World, and probably some other Asiatic ones as yet insufficiently investigated.

1. *H. australiana*, *F. Muell. Fragm.* iv. 120. A small tree, quite glabrous. Leaves large, pinnate, the rachis articulate; leaflets few, ovate, oval-oblong or ovate-lanceolate, shortly acuminate, often above 6 in. long, smooth and shining, but prominently veined almost as in *Heptapleurum venulosum*. Umbels pedunculate, with the peduncles almost verticillate along the elongated branches of a large loose terminal panicle. Calyx-border slightly sinuate-toothed. Disk broadly conical, though not quite so thick as in *H. helix*. Style very shortly cylindrical or reduced to a small boss on the centre of the disk. Drupe above 2 lines diameter, with 5 hard pyrenes, enclosing a seed with a deeply ruminant surface.—*Irvingia australiana*, *F. Muell. Fragm.* v. 19; *Kissodendron australianum*, *Seem. Journ. Bot.* iii. 201.

Queensland. Herbert river, *F. Mueller*; Rockingham Bay, *Dallachy*.

The semi-superior appearance of the ovary of *Hedera helix* is due to the thickness of the epigynous disk, and the only character remaining to separate *H. australiana* generically from it is the compound foliage, which can scarcely be admitted in an Order where it is so peculiarly variable.

5. *HEPTAPLEURUM*, Gaertn.

(*Paratropia*, *Blume*.)

Calyx-teeth minute or inconspicuous. Petals 5 or 6, or rarely more, valvate. Stamens as many as petals. Disk flat or convex. Ovary with 5 or 6, rarely more cells. Styles united in a short cone, with as many sessile scarcely prominent stigmas as cells. Fruit nearly globular, the endocarp not very hard, forming 5 or 6, rarely more, 1-seeded pyrenes.—Trees or tall shrubs. Leaves digitately compound. Flowers mostly unisexual, not articulate on the pedicel, umbellate, the umbels arranged in terminal panicles or racemes.

A considerable genus dispersed over tropical and eastern temperate Asia, the only Australian species being one which has the widest range in East India.

1. *H. venulosum*, *Seem. Journ. Bot.* iii. 80. A tall shrub or tree, quite glabrous. Leaflets 5 to 7, on long petiolules, mostly elliptical or oval-oblong, acuminate, 4 to 8 in. long, but in some Indian specimens short and obtuse, coriaceous, somewhat shining, the pinnate veins and reticulate veinlets very prominent. Stipules adnate to the petiole at the base only, united

within it into a single obtuse lamina. Umbels in a divaricately-branched panicle shorter than the leaves. Male flowers with exserted stamens, and scarcely any rudiment of the ovary. Females often with more or less perfect stamens. Parts of the flowers 5 or 6. Fruit about 2 lines diameter.—*Paratropia venulosa*, W. and Arn. Prod. 377; Wight, Illustr. t. 118; F. Muell. Fragm. iv. 121; *Aralia Moorei*, F. Muell. Fragm. ii. 108.

Queensland. Wide Bay, *C. Moore*.—The species is widely dispersed over East India.

6. BRASSAIA, Endl.

Calyx-tube broad, adnate to the ovary, without any prominent border. Petals 7 to 18, usually about 12, valvate, usually cohering at the apex. Stamens as many as petals. Disk not thick, broad, with as many radiating furrows as cells, and confluent with the slightly raised styles or base of the radiating stigmas. Ovary with as many cells as parts of the flower and stigmas. Fruit with as many 1-seeded laterally compressed pyrenes as cells of the ovary.—Tree. Leaves digitately compound. Flowers sessile in little dense heads, shortly pedunculate in long racemes, each flower embedded in a cup-shape involucre of 4 small imbricate bracts.

The genus is limited to a single species, endemic in Australia.

1. **B. actinophylla**, Endl. Nov. Stirp. Dec. 59. A handsome tree, attaining 40 ft., quite glabrous. Leaflets 7 to 16, petiolulate, oblong or obovate-oblong, very shortly acuminate, coriaceous, entire, 6 in. to 1 ft. long. Stipules united in a single interpetiolar stipule, adnate to the petiole at the base. Flower-heads scarcely above $\frac{1}{2}$ in. diameter, on peduncles, sometimes very short, rarely $\frac{1}{2}$ to 1 in. long, rather numerous along the stout rachis of the racemes, which attain sometimes several feet, and are often several together at the end of the branch, each one subtended by long acuminate leafless stipules.—F. Muell. Fragm. ii. 108, iv. 121; Seem. Journ. Bot. ii. 213.

Queensland. Endeavour river, *Banks and Solander*, *A. Cunningham*; Cape York, *W. Hill*; Palm Island, *Henne*; Port Moller, *Fitzalan*; Rockingham Bay, *Dallachy*; Boyd river, *C. Moore*.

ORDER LVIII. CORNACEÆ.

Calyx-tube adnate to the ovary; limb forming a raised border, entire or with as many teeth as petals. Petals 4, 5, or rarely more, valvate in the bud, inserted round an epigynous disk or on the calyx-border, rarely wanting. Stamens as many or rarely twice as many as the petals, and inserted with them; anthers with parallel cells opening longitudinally. Ovary inferior, 1- or 2-celled, with one anatropous pendulous ovule in each cell; style simple, with a terminal entire or rarely lobed stigma. Fruit an indehiscent drupe, with a 1- or 2-celled nucleus. Seeds solitary, pendulous, with a fleshy albumen and thin testa; embryo straight, nearly as long as the albumen, the radicle superior and shorter than the flat cotyledons.—Trees shrubs or very rarely herbs. Leaves opposite or rarely alternate, entire or slightly lobed, without stipules. Flowers usually small, in axillary or terminal heads cymes or corymbose panicles.

A small Order, generally scattered over the globe, but most abundant in the temperate regions of the northern hemisphere. It is represented in Australia by a single genus common to tropical Asia and Africa, and belonging to the small section of *Alangieæ*, differing in alternate leaves and in some other respects from the majority of the Order.

1. *MARLEA*, Roxb.

(*Rhytidandra*, A. Gray; *Pseudalangium*, F. Muell.)

Calyx-limb minutely toothed. Petals narrow-linear. Stamens the same number as petals, the filaments adhering to the petals at the base and connecting them in an apparently tubular corolla; anthers adnate, long and linear. Ovary 1- or 2-celled; style filiform, with a 2- or 4-lobed or capitate stigma. Drupe often reduced to 1 cell and seed.—Trees or shrubs. Leaves alternate. Flowers in axillary cymes.

Besides the Australian species, which is also in the islands of the South Pacific, there are three others in tropical Asia and Africa.

1. *M. vitiensis*, Benth. A tree, attaining a considerable height, glabrous or the young branches pubescent or villous. Leaves ovate ovate-lanceolate or oblong, shortly acuminate, more or less oblique and unequal at the base or rarely equal, 3 to 5 in. long, glabrous or slightly pubescent underneath in the normal form. Flowers in short axillary cymes on slender peduncles, rarely much exceeding the petioles. Calyx-limb cup-shaped, about $\frac{2}{3}$ line diameter. Petals 4 to 6, varying in length from 1 to 6 lines, connected by the stamens up to from $\frac{1}{4}$ to $\frac{1}{2}$ their length, revolute at the ends. Filaments villous; anthers about the length of the corolla, the valves involute, dividing each cell into 2 before they open and marked with transverse constrictions, which give them the appearance of being chambered. Disk cup-shaped, enclosing the base of the style. Style divided at the end into 2 linear stigmatic lobes. Ovary 1-celled with 1 ovule. Drupe ovoid, about $\frac{1}{2}$ in. long.—*Rhytidandra vitiensis*, A. Gray, Bot. Amer. Expl. Exped. i. 303. t. 28, and in Proc. Amer. Acad. vi. 55; *Pseudalangium polysomoides*, F. Muell. Fragm. ii. 84; *Rhytidandra polysomoides*, F. Muell. Fragm. ii. 176.

Queensland. Rockingham Bay, *Dallachy*.

N. S. Wales. Clarence river, *Beckler*, C. Moore; Richmond river, *Beckler*.

Var. *tomentosa*. Softly villous all over, or the upper side of the leaves alone glabrous. Flowers villous, the petals more deeply free than usual.—Fitzroy river, *Thozet*; Rockhampton, *Dallachy*; Moreton Bay, *W. Hill*.

The apparently chambered anthers are not really so, and traces of the constrictions may often be seen in *M. bayonifolia*, the latter differs also in the large thick disk, the 2-celled ovary, and shortly 4-lobed style; but *M. barbata* has the thick disk with a 1-celled ovary and 2-lobed style, and an unpublished Malayan species has a small disk, with a 1-celled ovary, and almost entire style, all these distinctions proving thus to be specific, not generic.

ORDER LIX. LORANTHACEÆ.

Calyx-tube adnate to the ovary, the limb with as many lobes or teeth as petals, or forming an entire border, or none. Petals (or segments of the perianth when the calyx is inconspicuous) 4 to 6 or rarely more, free or united in a lobed corolla, inserted round an epigynous disk, valvate in the bud, rarely wanting. Stamens as many as petals, opposite to and usually inserted on

them. Ovary inferior, 1-celled, with 1 erect ovule, usually not perceptible till the flowering is past, and adnate to the wall of the cell so as to have been described as pendulous; style or stigma simple. Fruit an indehiscent berry or drupe, with a single seed. Albumen fleshy. Embryo straight, with a superior radicle.—Shrubs, usually much branched, parasitical on the branches of trees and shrubs, sometimes so near their roots as to appear terrestrial, very rarely (only in two Australian species) really terrestrial shrubs or trees. Leaves opposite or rarely alternate, usually thick and leathery or sometimes fleshy, sometimes reduced to minute scales or none. Bracts usually one under each flower or pedicel, with 2 bracteoles close under the flower, concave or united in a little cup, having the appearance of an external calyx, or the bracteoles or very rarely the bracts also wanting.

A considerable Order, chiefly abundant within or near the tropics both in the New and the Old World, with a very few species from more temperate regions in the northern as well as in the southern hemisphere. Of the five Australian genera, two have a very wide range over nearly the whole area of the Order, the other three are endemic. In the arrangement and delimitation of the groups, I have been guided by Professor Oliver's careful study of the Order in Journ. Linn. Soc. vii.

Calyx-border distinct. Anthers oblong or linear, with parallel cells opening longitudinally. Flowers (in Australian species) elongated, hermaphrodite.

Terrestrial tree. Fruit broadly 3-winged 1. NUYTSIA.

Terrestrial shrub. Fruit a drupe, the endocarp with 8 internal ridges corresponding with furrows in the seed 2. ATRINSONIA.

Parasitical shrubs. Fruit succulent. Seed not furrowed 3. LORANTHUS.

Perianth apparently simple. Anthers broad, opening transversely or in pores. Flowers very small, unisexual.

Anthers sessile on the perianth-segments, opening inwards in several pores. Plants glabrous, leafless or leafy 4. VISCUM.

Anthers at the base of the perianth-segments, opening transversely. Plants leafy, hoary or tomentose 5. NOTOTHIXOS.

1. NUYTSIA, R. Br.

Flowers of *Loranthus*. Petals free. Anthers versatile. Fruit a dry drupe or nut, with 3 broad longitudinal wings.—Terrestrial tree. Leaves alternate. Flowers racemose.

The genus is limited to a single species, endemic in Australia.

1. **N. floribunda**, R. Br. in Journ. Geogr. Soc. i. 17; Bot. Works, i. 308. A tree of 30 to 35 ft., quite glabrous, with spreading branches. Leaves linear, acute or obtuse, mostly $1\frac{1}{2}$ to 3 in. long, entire, thick, the lower ones of the new shoots reduced to small scales. Flowers orange-yellow, in showy racemes crowded at the ends of the branches. Pedicels $\frac{1}{4}$ to $\frac{1}{2}$ in. long, with 3 lanceolate obtuse bracts (1 bract and 2 bracteoles) close under the flower, small at the time of flowering, often enlarging afterwards. Calyx-limb unequally 6-toothed. Petals 6, linear, nearly $\frac{1}{2}$ in. long. Fruit about $\frac{1}{2}$ in. long, the wings short and thick. Embryo with 3 or 4 unequal cotyledons.—Lindl. Swan Riv. App. t. 4; Fenzl in Hueg. Enum. 57; Miq. in Pl. Preiss. i. 279; Oliv. in Journ. Linn. Soc. vii. 96; *Loranthus floribundus*, Labill. Pl. Nov. Holl. i. 87. t. 113.

W. Australia. King George's Sound, R. Brown and others, and thence to Swan River, Drummond, 1st Coll., Preiss. n. 1608, and others, and Murchison river, Oldfield.

2. *ATKINSONIA*, F. Muell.

Flowers of *Loranthus*. Petals free. Anthers versatile. Fruit a drupe, not winged, the endocarp hard, with 8 longitudinal internal ribs protruding into as many deep furrows of the seed.—Terrestrial shrub. Leaves alternate. Flowers in axillary racemes.

The genus is limited to a single species, endemic in Australia.

1. *A. ligustrina*, F. Muell. *Fragm.* v. 34. An erect bushy shrub, attaining 2 or 3 ft. in barren rocky situations, twice that height in other places. Leaves oblong-lanceolate, obtuse, narrowed into a short petiole, mostly 1 to 1½ in. long, not fleshy, the margins often recurved. Flowers on very short pedicels, in axillary racemes much shorter than the leaves. Bracteoles 2, close under the flower, the third or subtending bract often a little lower on the pedicel. Calyx-limb obscurely toothed. Petals usually 6, occasionally 7 or 8, linear, about 3 lines long. Drupe small, ovoid-oblong, the exocarp thin.—*Nuytsia ligustrina*, A. Cunn.; Lindl. Swan Riv. App. 39; F. Muell. *Fragm.* ii. 130.

N. S. Wales. Blue Mountains, A. and R. Cunningham and others.

3. *LORANTHUS*, Linn.

Calyx-limb short, truncate or toothed. Petals 4 to 8, free or more or less united in a tubular corolla, spreading at the ends. Stamens inserted on the base of the petals; filaments distinct; anthers adnate or versatile, with parallel cells opening longitudinally. Style filiform, with a terminal stigma. Fruit a berry, usually crowned by the limb of the calyx.—Parasitical shrubs. Leaves opposite or rarely alternate. Flowers hermaphrodite, axillary or terminal, in racemes or cymes or solitary, long and brightly coloured, or green at least at the tips, or, in species not Australian, small and green. Bracts in all the Australian species solitary, small and concave, close under each flower, without the 2 bracteoles which are in many extra-Australian species.

A very large genus, almost wholly tropical or subtropical, in America, Africa, and Asia, with one species as far north as the south of Europe. Of the 15 Australian species, one is common in Asia, another extends into Timor and perhaps over several of the islands of the Indian Archipelago; the remaining 13, as far as hitherto ascertained, are endemic.

Several of the Australian species, besides the Asiatic *L. longiflorus*, appear to have two forms of leaves, so different in aspect that it is difficult to fancy that the two belong to one species; the one sessile, broad, and deeply cordate, the other petiolate, narrow, and contracted at the base. Many also, probably, vary in the colours of the flower more or less red or yellow-orange, with or without green tips or the green extending to below the middle. The notes of the collectors on the trees on which the several species grow, are so varied that there seems to be no evidence that particular species affect particular trees. The most commonly noted are *Eucalyptus*, *Casuarina*, and *Exocarpus*, but *Acacia*, *Banksia*, *Melaleuca*, *Fusanus*, and many others are also mentioned as feeding species of *Loranthus*.

Anthers versatile, oblong. Petals free. Leaves opposite. Inflorescence mostly terminal.

- | | |
|---|-----------------------------|
| Leaves petiolate, thick, from short and obovate to long lanceolate and falcate. Cymes several-flowered. | 1. <i>L. celastroides</i> . |
| Leaves small, sessile or nearly so. Peduncles slender, 2-flowered. | |
| Leaves linear, narrowed at the base. | 2. <i>L. Bidwillii</i> . |
| Leaves ovate, rounded at the base. | 3. <i>L. myrtifolius</i> . |

- Anthers adnate, linear. Petals united to the middle or higher up.
 Leaves alternate or opposite. Inflorescence axillary.
 Flowers several, in racemes 4. *L. longiflorus*.
 Flowers several, in cymes.
 Flowers and inflorescence glabrous. Calyx-limb truncate, much shorter than the adnate tube.
 Leaves linear or linear-lanceolate. S. coast plant . . . 5. *L. angustifolius*.
 Leaves obovate to oblong. N. S. Wales and Queensland plant.
 Cymes rather loose, shortly pedunculate 6. *L. dictyophlebus*.
 Cymes reduced to a sessile cluster 7. *L. alyxifolius*.
 Flowers and inflorescence hoary-tomentose. Calyx-limb 5-toothed, nearly as long as the adnate tube. Cymes sessile, few-flowered 8. *L. odontocalyx*.
 Flowers solitary or in pairs.
 Leaves mostly opposite, coriaceous.
 Leaves terete, slender 9. *L. linearifolius*.
 Leaves flat, from narrow-linear to oblong-cuneate . . . 10. *L. Exocarpi*.
 Leaves all alternate, thin. Pedicels slender 11. *L. acacioides*.
 Anthers adnate, linear. Petals free. Leaves mostly opposite.
 Flowers in clusters of 2, the clusters in axillary racemes . . . 12. *L. signatus*.
 Flowers in loose terminal cymes 13. *L. maytenifolius*.
 Flowers in axillary cymes (or umbels), the common peduncle with 2 to 5 diverging or divaricate umbellate branches.
 Branches of the peduncle (usually 3 or 4) bearing each a single flower 14. *L. sanguineus*.
 Peduncle twice forked with 1 flower to each branch . . . 15. *L. bifurcatus*.
 Branches of the peduncle usually 3 or 4, each bearing 3 flowers.
 Leaves terete 16. *L. linophyllus*.
 Leaves flat.
 Lateral flowers of the 3, or all 3, pedicellate. Plant glabrous 17. *L. pendulus*.
 Flowers all 3 closely sessile. Plant more or less hoary-tomentose, at least the calyx 18. *L. Quandang*.
 Flowers sessile on the dilated apex of the peduncle, between 2 large bracts or floral leaves 19. *L. grandibracteus*.

1. ***L. celastroides***, Sieb. in *Roem. and Schult. Syst.* vii. 163. Glabrous. Leaves opposite, from obovate or ovate, 1 to 2 in. long to cuneate-oblong lanceolate or almost linear, and 4 in. long or more, and when narrow often falcate, obtuse or very rarely almost acute, narrowed into a petiole. Flowers in loose terminal trichotomous cymes, shortly pedunculate and always shorter than the last leaves, sometimes appearing axillary from the shortness of the flowering-branch. Calyx-border scarcely prominent, obscurely sinuate-toothed. Petals 5 or 6, free, about $1\frac{1}{2}$ in. long. Anthers versatile, oblong. — DC. Prod. iv. 318; A. Gray, Bot. Amer. Expl. Exped. i. 740. t. 100; F. Muell. Rep. Burdek. Exped. 13; *L. eucalyptifolius*, Sieb. in *Roem. and Schult. Syst.* vii. 163, not of H. B. and K.; *L. eucalyptoides*, DC. Prod. iv. 318; A. Gray, Bot. Amer. Expl. Exped. i. 741; F. Muell. Pl. Vict. t. 30.

Queensland. Brisbane river, Moreton Bay, F. Mueller.

N. S. Wales. Port Jackson to the Blue Mountains, R. Brown, Sieber, n. 242 and 244, and others; northward to Clarence river, Beckler, and southward to Twofold Bay, Mossman.

Victoria. On the Yarra, F. Mueller, Robertson; Lake King, F. Mueller.

The broad-leaved specimens (*L. celastroides*) are specially noted as growing on *Banksia* and *Casuarina*, and the narrow-leaved (*L. eucalyptoides*) on *Eucalyptus* and *Casuarina*. In Beckler's series of specimens from Clarence river, several are quite intermediate as to the shape of the leaf.

2. ***L. Bidwillii*, Benth.** Glabrous, with slender branches. Leaves opposite, narrow-linear, obtuse, shortly contracted at the base, but scarcely petiolate, rarely exceeding 1 in. Peduncles terminal or apparently axillary from the shortness of the flowering-branch, short but filiform, with 2 filiform 1-flowered branches not exceeding the last leaves. Calyx-border scarcely prominent, obscurely toothed. Petals 5, free, very narrow, nearly 1 in. long. Anthers versatile.

Queensland. Wide Bay, *Bidwill*.

3. ***L. myrtifolius*, A. Cunn. Herb.** Glabrous, with slender branches. Leaves opposite, sessile, ovate, obtuse, rounded or almost cordate at the base, not thick, $\frac{1}{2}$ to 1 in. long. Peduncles terminal or apparently axillary from the shortness of the flowering-branch, filiform, with 2 filiform 1-flowered branches, scarcely exceeding the leaves. Calyx-border scarcely prominent, obscurely toothed. Petals 5, free, very narrow, above 1 in. long. Anthers versatile.

N. S. Wales. Logan Vale, *A. Cunningham*.

4. ***L. longiflorus*, Desr. in Lam. Dict. iv. 598.** Glabrous or the inflorescence slightly tomentose. Leaves alternate, in the ordinary form petiolate, from broadly ovate or ovate-lanceolate to narrow-lanceolate, obtuse, narrowed at the base, mostly 2 to 4 in. long, thick, obscurely veined. Flowers large, in short dense axillary racemes, rarely reduced to 2 or 3 flowers, all distinctly and singly pedicellate. Calyx-limb prominent, truncate, often oblique and sometimes obscurely toothed. Petals 5, $1\frac{1}{4}$ to $1\frac{1}{2}$ in. long, united to about two-thirds of their length into a slightly swollen tube, occasionally splitting as the corolla fades, the upper portion of the petals reflexed at the time of flowering. Anthers narrow-linear, adnate.—DC. Prod. iv. 304; W. and Arn. Prod. 384; Wight, Ic. t. 302; *L. indicus*, Desr. in Lam. Dict. iv. 601, not of DC.; *L. vitellinus*, F. Muell. Rep. Burdek. Exp. 12.

N. Australia. Victoria river, *F. Mueller*; islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Shoalwater passage, *R. Brown*; Port Curtis, *M'Gillicray*; Burdekin and Gilbert rivers, *F. Mueller*; Port Denison, *Burdekin Expedition*; Edgecombe Bay, *Dallachy*; Gloucester island, *Henne*; Brisbane river, Moreton Bay, *A. Cunningham*, *F. Mueller*, and others; in the interior, *Mitchell*.

N. S. Wales. Port Jackson to the Blue Mountains, *Mossman*, *Woolfs*, and others; New England, *C. Stuart*; on the Murrumbidgee, *M'Arthur*.

Var. ? *amplexifolius*, Thw. Enum. Ceyl. Pl. 134. Leaves sessile, orbicular cordate.—*L. amplexifolius*, DC. Prod. iv. 305; W. and Arn. Prod. 384.—Arnhem's Land, *F. Mueller*; Suttor river, *Dorsay*; Cooper Creek, *Bowman*. The specimens are fragmentary and do not show whether this be a distinct variety or only a form of leaf assumed at a particular age or on some branches only.

5. ***L. angustifolius*, R. Br. Herb.** Glabrous. Leaves mostly opposite, linear or linear-lanceolate, often falcate, 3 to 4 in. long, thick, veinless or 3-nerved, narrowed into a short petiole. Cymes 3- to 5-flowered, sessile in the axils and the branches very short. Calyx-limb small, with scarcely conspi-



curious tooth. Corolla $1\frac{1}{2}$ in. long, rather slender, the petals united to above $\frac{1}{2}$ their length into a slightly dilated tube, splitting on the upper side when old. Anthers narrow-linear, adnate.

S. Australia. Port Lincoln or Memory Cove, *R. Brown*. Nearly allied both to *L. dictyophlebus* and *L. alyxifolius*, but slightly differing from both in inflorescence and, as far as hitherto known, very much in foliage. The station is also distant.

6. **L. dictyophlebus**, *F. Muell. Rep. Burdet. Exped.* 11. Glabrous. Leaves mostly opposite, from broadly obovate or orbicular to oblong-elliptical, obtuse, narrowed into a distinct petiole, sometimes all under 3 in. long, broad and thick, with the veins scarcely conspicuous, sometimes 4 to 5 in. long, smooth and shining, with the reticulate veins as well as the primary veins prominent. Peduncles short, axillary, each with 3 or 4 short 3-flowered branches. Calyx-tube or ovary very narrow; limb small, the teeth scarcely conspicuous. Corolla $1\frac{1}{2}$ in. long, slender, the petals united to about $\frac{1}{2}$ their length into a slightly dilated tube, often splitting when old. Anthers narrow-linear, adnate.

Queensland. Rockhampton, *Endlicher*; Bellarine river, Moreton Bay, *A. Cunningham*, *F. Mueller*.

N. S. Wales. Botany Bay, *R. Brown*; Clarence and Hastings rivers, *Beckler*, Kiama, *Harvey*; Illawarra, *Shepherd*.

7. **L. alyxifolius**, *F. Muell. Herb.* Glabrous, or the inflorescence minutely rusty-tomentose. Leaves opposite, from broadly obovate to obovate-oblong, very obtuse, tapering into a very short petiole, mostly from 2 to 3 in. long, thick and obscurely veined. Flowers long and slender, almost sessile, in dense axillary cymes or clusters. Calyx-border short, obscurely sinuate-toothed. Petals $1\frac{1}{2}$ in. long, united to at least $\frac{1}{2}$ of their length in a scarcely dilated tube, often split on the upper side. Anthers adnate, narrow-linear.—*L. myrtenifolius*, *F. Muell. Rep. Burdet. Exped.* 11, not of *A. Gray*.

Queensland. Brisbane river, Moreton Bay, *F. Mueller*, *W. Hill*.

N. S. Wales. Newcastle, *R. Brown*; Hastings, Clarence, and Richmond rivers, *Beckler*; Illawarra, *Shepherd*.

8. **L. odontocalyx**, *F. Muell. Herb.* Glabrous, except the inflorescence, or slightly hoary-tomentose. Leaves mostly alternate, oblong, cuneate-oblong or lanceolate, obtuse, narrowed into a short petiole, under 3 in. long, thick and scarcely veined. Cymes axillary, sessile or very shortly pedunculate, usually 3- to 7-flowered, the short branches and pedicels hoary-tomentose as well as the buds. Calyx tomentose, the limb more prominent than in the allied species, nearly as long as the adnate tube, 5-toothed. Petals 5, not quite 1 in. long, united to above the middle. Anthers adnate, linear. Young fruits crowned by a long neck formed by the calyx-limb.

N. Australia. Towards M'Adam Range and Providence Hill, *F. Mueller*.

A very imperfect specimen with broader leaves, from Howick's Group on the coast of Queensland, *F. Mueller*, appears to belong to the same species.

9. **L. linearifolius**, *Hook. in Mitch. Trop. Austr.* 102. Glabrous. Leaves mostly opposite, terete, slender, sometimes almost filiform, acute or obtuse, usually 2 to 3 in. but sometimes above 4 in. long. Flowers axillary, pedicellate in pairs, the pedicels sessile or borne on a common peduncle of 1

to 2 lines. Calyx-border obscurely toothed. Petals usually 6, about 1 in. long, united to about the middle in a slightly dilated tube, often split on the upper side. Anthers adnate, linear.

Queensland, Bowman; Narran river, Mitchell.

S. Australia. N.W. interior, M'Donnell Stuart's Expedition.

W. Australia. Sharks' Bay, Denham; between Moore and Marchison rivers, Drummond, 6th Coll. n. 117; Port Gregory, Oldfield.

10. **L. Exocarpi**, Behr in *Linnaea*, xx. 624. Glabrous. Leaves mostly opposite, but here and there alternate, from oblong-cuneate to narrow-linear, but always flat, obtuse, narrowed into a petiole, mostly $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, rather thick, often triplinerved. Flowers axillary, pedicellate, solitary or in pairs, the thick pedicels sessile or more rarely borne on a very short common peduncle. Calyx-border obscurely toothed. Petals usually 6, above 1 in. long, united to about $\frac{1}{3}$ of their length. Anthers adnate, linear.—*L. subfalcatus*, Hook. in Mitch. Trop. Austr. 224.

N. Australia. N.W. coast, Bynoe; Victoria river, F. Mueller; islands of the Gulf of Carpentaria, R. Brown, Henne; M'Donnell range, M'Donnell Stuart's Expedition.

Queensland. Keppel Bay, R. Brown; Port Denison, Fitzalan; Mount Archer, DeLake; Brisbane river, Morton Bay, F. Mueller, Fitzalan; Flinders river, Brown; Lake Salvador, Mitchell.

N. S. Wales. Upper Darling river, Bowman; Murrumbidgee river, Backhouse.

Victoria. Murray river, Bacchus marsh, Yarra-Yarra, etc., F. Mueller.

S. Australia. Near the Barossa range, Behr; from the Murray to Spencer's Gulf, F. Mueller and others; Cooper's Creek, Howitt's Expedition.

The tropical specimens have usually broader, more cuneate leaves, the southern ones frequently but not always very narrow linear leaves.

11. **L. acacioides**, A. Cunn. Herb. Glabrous, with slender branches. Leaves alternate, oblong or lanceolate, obtuse, narrowed into a petiole, rarely above 2 in. long, rather thin and often 3-nerved. Peduncles axillary, solitary or in pairs, short but slender, reflexed, each with 2 flowers, on short slender pedicels. Calyx-limb prominent, truncate or sinuate-toothed. Petals not quite 1 in. long, united to about $\frac{2}{3}$ of their length into a slightly dilated tube. Anthers adnate, narrow-linear.

N. Australia. N.W. coast, A. Cunningham; Victoria and Fitzmaurice rivers, F. Mueller.

12. **L. signatus**, F. Maell. Herb. Glabrous. Leaves opposite or nearly so, in the ordinary form from obovate to oval-oblong or elliptical obtuse, narrowed into a short petiole, 2 to 4 in. long, rather thick, but more or less prominently veined, but in some specimens all sessile, orbicular-cordate, with large rounded auricles, and in others mostly narrow-lanceolate and 4 or 5 in. long. Flowers in clusters of 3, almost sessile along the rhachis of dense axillary 1-sided racemes of 1 to 2 in., with 1 bract under each flower as in all the Australian species. Calyx-border obscurely sinuate-toothed. Petals 5 or 6, free, narrow, about 1 in. long, not dilated at the end. Anthers adnate, linear, very narrow.—*L. indicus*, DC. Prod. iv. 305, not of Desr.

N. Australia. Arnhem S. Bay and islands of the Gulf of Carpentaria, R. Brown; N. coast, F. Mueller; Quail island, Flood (the latter with broad cordate leaves).

Queensland. Gilbert river, F. Mueller; N.E. coast, A. Cunningham, R. Brown (both with long narrow leaves).

The variations in the leaf appear to be the same as in the case of *L. longiflorus* and *L. pendulus*, but not having seen the sessile cordate and the narrow petiolate leaves on the same specimen, I am unable to say whether they represent distinct varieties or different ages or parts of the same individual. The species is also in Timor, whence De Candolle had the specimens in which he thought he had identified Desrousseaux's *L. indicus*, above referred to *L. longiflorus*. Cuming's n. 1945, from the Philippine Islands, may also be the same, and if so, the species has a wide range in the Archipelago, but is not, I believe, in Continental India. *L. insularis*, A. Gray, a S. Pacific island plant, to which F. Mueller had referred these specimens, appears to me to be quite distinct.

13. ***L. maytenifolius***, A. Gray, *Bot. Amer. Expl. Exped.* i. 739. t. 99. Glabrous. Leaves opposite, petiolate, broadly ovate or obovate, not exceeding 2 in. in our specimen, not thick, irregularly veined. Flowers in terminal shortly pedunculate cymes, with 1 bract under each flower. Calyx-border rather deeply cup-shaped, truncate. Petals 6 or occasionally 5, free, narrow. Anthers adnate, linear.

N. S. Wales. Grose river, R. Brown; Woolongong, *American Exploring Expedition*.

This species, as shown by our specimen communicated by A. Gray, and well represented in his plate, differs from all other Australian free-petaled species with adnate stamens by the terminal inflorescence. A. Gray states the inflorescence to be also sometimes in the upper axils, but that was owing probably to his having on a hasty inspection referred to it a specimen in the Hookerian Herbarium, labelled, with doubt, "New Holland, Fraser." This however must be a mistake, the specimen is probably not Australian, differing from all others from that country in the presence of 3 bracts (a bract and 2 bracteoles) under each flower.

14. ***L. sanguineus***, F. Muell. *Fragm.* i. 177, and *Rep. Burdek. Exped.* 13. Glabrous and more or less glaucous, usually pendulous. Leaves mostly opposite, oblong-linear to linear-lanceolate and falcate, obtuse, 3 to 6 in. long, thick, obscurely veined or veinless. Flowers axillary, the common peduncle bearing 3 or 4 umbellate divaricate branches, as in *L. pendulus*, but each with only 1 flower. Calyx-border very short, truncate. Petals 5 or 6, free, narrow, about $1\frac{1}{2}$ in. long, the slightly dilated apex of the bud remarkably angular. Anthers adnate, linear. Stigma capitate, much larger than in the allied species.

N. Australia. Victoria river, F. Mueller; islands of the Gulf of Carpentaria, R. Brown; Bentinck's island and Albert river, Henne.

15. ***L. bifurcatus***, Benth. Glabrous and more or less glaucous. Leaves mostly opposite, linear-lanceolate, falcate, obtuse or almost acute, 4 to 8 in. long, thick, often 3-nerved. Flowers axillary, the common peduncle twice forked, each branch bearing a single flower, without any in the forks. Calyx-border reduced to a scarcely conspicuous line. Petals 5 or 6, free, narrow, about 1 in. long, the buds dilated at the base to a diameter greater than that of the calyx-tube, and clavate, but not angular at the end. Stigma not large.

N. Australia. Islands of the Gulf of Carpentaria, R. Brown. Allied to *L. sanguineus* and *L. pendulus*, differing from both chiefly in the ramification of the peduncle.

16. ***L. linophyllus***, Fenzl in *Hueg. Enum.* 56. Quite glabrous or the young shoots inflorescence and flowers, or the inflorescence only, hoary-tomentose or almost wholly. Leaves opposite, terete and usually slender, like those of *L. linearifolius*, or sometimes thicker, but never flat, mostly 2 to 3

in. long, but sometimes above 4 or under $1\frac{1}{2}$ in. Flowers in axillary or lateral cymes, the common peduncle very short, bearing an umbel of 3 or 4, rarely 2 rays, each with a partial cyme of 3 or rarely 5 flowers, as in *L. pendulus*. Calyx-border scarcely prominent, truncate. Buds slender, clavate at the end. Petals free, 9 to 10 lines long. Anthers adnate, oblong-linear.—Miq. in Pl. Preiss. i. 279; *L. Preissii*, Miq. l. c. 280, Behr in Linnaea, xx. 625; *L. Casuarinæ*, Miq. l. c. 279; *L. scoparius*, Miq. l. c. 280.

N. Australia. Bay of Rest, N.W. coast, *A. Cunningham*; Sturt's Creek, *F. Mueller*.

Queensland. Brisbane river, Moreton Bay, *F. Mueller*; Warwick, *Beckler*.

N. S. Wales. Port Jackson, *R. Brown* and others; northward to Clarence river, *Beckler*; New England, *C. Stuart*; Liverpool plains, *A. Cunningham*; southward to Illawarra, *Herb. F. Mueller*; in the interior, *Mitchell*; towards the Barrier Range, *Victorian Expedition*.

Victoria. Port Phillip and near Melbourne, *Gunn, Robertson*; on the Murray towards Owens river, *F. Mueller*.

S. Australia. From the Murray to Spencer's Gulf, *F. Mueller*; Lake Torrens and Cooper's Creek, *Howitt's Expedition*.

W. Australia. Swan River, *Drummond, Preiss*, n. 1611, 1613, 1615, 1618; Murchison river, *Oldfield*; Sharks' Bay, *A. Cunningham*; Dirk Hartog's Isle, *Milne*.

There are three rather distinct forms: *a.* with glabrous flowers in W. and N.W. Australia, S. Australia, Victoria, and the desert interior of N. S. Wales; *b.* with slightly tomentose flowers, from the Brisbane to Port Jackson and Illawarra; *c.* with woolly-tomentose flowers, in New England and W. Australia.

17. ***L. pendulus*, Sieb. in DC. Prod. iv. 294, and Mem. Lor. t. 1.** Glabrous. Leaves mostly opposite, from obovate oblong-cuneate and about 2 in. long, to linear-lanceolate attaining sometimes 10 in. or even more, thick and usually 3- or 5-nerved, in a few specimens sessile, broad and cordate. Flowers in axillary cymes, the common peduncle short, bearing an umbel of 3 or 4 rarely 2 rays, each with a partial cyme of 3 rarely 5 flowers, the central one sessile, or rarely all pedicellate. Calyx-border shortly cup-shaped, truncate. Buds slender, clavate at the tips. Petals free, 1 to $1\frac{1}{2}$ in. long. Anthers adnate, from oblong-linear to narrow-linear.—*L. congener*, Sieb. in DC. Prod. iv. 295, and Mem. Lor. t. 2 (leaves short, central flowers sessile); *L. longifolius*, Hook. Ic. Pl. t. 880 (leaves very long, central flowers sessile); *L. aurantiacus*, A. Cunn.; Hook. in Mitch. Trop. Austr. 101 (flowers all pedicellate); *L. Miquelii*, Lehm. in Pl. Preiss. i. 280 (flowers all pedicellate).

N. Australia. Victoria river, *F. Mueller*; Port Essington, *Armstrong*; Gilbert river, *F. Mueller*.

Queensland. Wide Bay, *Bidwill*; Rockingham Bay and Rockhampton, *Dallachy*; Brisbane river, Moreton Bay, *F. Mueller* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Sieber*, n. 241, 243, and Fl. Mist. n. 622, *A. Cunningham* and others; northward to Clarence, Macleay, and Hastings rivers, *Beckler*; New England, *C. Stuart*.

Victoria. Port Phillip, Yarra and Latrobe rivers, to the Murray, *F. Mueller* and others; N.W. of the colony, *Morton*.

S. Australia. S. coast, *R. Brown*; Lofty and Bugle ranges, Holdfast Bay, etc., *F. Mueller*.

W. Australia. Swan River and neighbourhood, *Drummond, Preiss*, n. 1617, *Oldfield*.

Var. *amplexifolius*. Leaves sessile, broad, cordate. Roebuck Bay, N.W. coast, *Marten*.

Var. *parviflorus*. Leaves small and narrow; flowers small, often 4-merous, the central ones sessile.—*L. Melaleuca*, Lehm. in Pl. Preiss. i. 281, Miq. in Ned. Kruidk. Arch. iv. 107; *L. miraculosus*, Miq. in Pl. Preiss. i. 281, and in Ned. Kruidk. Arch. iv. 106.—Paramatta, *Woolfs*; New England, *C. Stuart*; towards the Barrier Range, *Victorian Ex-*

pedition; Port Lincoln, *Wilhelmi*; interior of S. Australia, *M. D. Call Street*; Swan River, *Drummond*; Rottenest island, *A. Cunningham*, *Preiss*, n. 1616.

18. **L. Quandang**, *Lindl. in Mitch. Three Exped.* ii. 69. Foliage and inflorescence more or less hoary-tomentose, or rarely glabrous except the calyx. Leaves opposite, from ovate or oblong-cuneate and 1 to 2 in. long to lanceolate and 3 or 4 in. long, thick, veinless or obscurely 3-nerved. Flowers in axillary cymes, the common peduncle bearing an umbel of 2 or 3 rarely 4 rays, each with 3 closely sessile flowers. Calyx-tube tomentose, more contracted under the limb than in *L. proclitus*; limb tomentose or very rarely glabrous. Flowers otherwise of *L. proclitus*; petals free, under 1 in. long. Anthers adnate, oblong-linear.—*L. nutans*, *A. Cunn.*; *Hook. in Mitch. Trop. Austr.* 158; *L. canus*, *F. Muell. in Hook. Kew Journ.* viii. 145, and in *Trans. Vict. Inst.* 1855, 128; *Miq. in Ned. Kruidd. Arch.* iv. 107.

N. Australia. Victoria river and Sturt's Creek, *F. Mueller*; Thomson river, *A. C. Gregory*; islands of the Gulf of Carpentaria, *R. Brown*, *Meene*.

Queensland. *Boonma*; Koppal Bay, *R. Brown*; Suttor Desert, islands of Howick's group, and Moreton Bay, *F. Mueller*; Balyando river and Fitzroy Downs, *Mitchell*.

N. S. Wales. Port Jackson, *F. Mueller*; Hunter's River and in the western interior, *A. Cunningham*, *Fraser*; from the Darling to the Barrier Range, *Victorian Expedition*, *Dallachy* and *Goodwin* and others.

Victoria. Grampians, *Mitchell*, *F. Mueller*; Dandenong Creek, *Wilhelmi*; Buffalo Creek, *F. Mueller*.

S. Australia. Cooper's Creek, *Howitt's Expedition*.

W. Australia. Murchison river, *Oldfield*, *Drummond*, 6th Coll. n. 116.

Var. ? *amplexifolius*. Leaves broad, sessile, cordate.—Victoria river, *F. Mueller*; the specimen very imperfect and doubtful.

19. **L. grandibracteus**, *F. Muell. Rep. Burdck. Exped.* 14. Glabrous. Leaves opposite, from oblong-cuneate to linear-lanceolate, obtuse, narrowed into a petiole, 2 to 4 in. long or more when narrow, thick, veinless or obscurely 3-nerved. Peduncles at the forks of the branches, each about 1 in. long, very much flattened and dilated at the end into a truncate receptacle, bearing 4 to 6 closely sessile flowers between 2 broadly ovate or ovate-lanceolate obtuse floral leaves or leafy bracts, 1 to 1½ in. long, and obscurely several-nerved. Bracts under each flower minute or none. Calyx nearly 2 lines long, with a very short denticulate-ciliate limb. Petals free, nearly 1 in. long; anthers adnate, linear.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; between Albert and Flinders rivers, *F. Mueller*.

Queensland. Sandy Cape, *R. Brown*; Suttor river, *Bowman*.

S. Australia. Cooper's Creek, *Victorian Expedition*; N. interior, *Capt. Strett*.

4. VISCUM, Linn.

Flowers unisexual. Calyx-border inconspicuous, or rarely forming a scarcely prominent line. Petals 3 to 5, very short, having the appearance of a simple perianth. Anthers sessile on the petals, short and broad, opening inwards in several pores in transverse rows. Stigma sessile. Fruit a one-seeded berry. Parasitical glabrous shrubs. Branches opposite or dichotomous. Leaves opposite or none. Flowers very small, green or yellowish,

monoecious and clustered at the nodes in all the Australian species, dioecious and in the forks of the branches in the common European one.

The genus is spread over Asia, Africa, and temperate Europe. The three Australian species are all Asiatic also. They are sometimes found growing upon species of *Loranthus*, as well as upon the trees that feed them.

Leaves opposite at the nodes. Petals deciduous 1. *V. orientale*.
Leaves none.

Branches slender, angular, not flattened. Petals deciduous 2. *V. angulatum*.

Branches flattened. Petals persistent 3. *V. articulatum*.

1. ***V. orientale*, Willd.; DC. Prod. iv. 278.** Branches elongated, nearly terete, always leafy. Leaves opposite, narrow-oblong or lanceolate, and 1 to $1\frac{1}{2}$ in. long in the Australian specimen, from that to obovate and varying from 1 to 3 in. in Asiatic ones, narrowed at the base, 3- or 5-nerved. Flowers minute, in 1 to 3 sessile or shortly pedicellate clusters in each axil, each cluster consisting of 3 or 5 flowers, the central one or rarely 3 females, each under 1 line long, the 2 lateral ones males and much smaller, all sessile in the clusters within 1 or 2 small bracts. Petals 4 or rarely 3, deciduous. Berry globular, 2 or rarely 3 lines diameter.

Queensland. Rocklampton, *Roemer*; a single small specimen in Herb. F. Muell. Common in India and the Archipelago, extending westward almost to the Mediterranean.

2. ***V. angulatum*, Heyne; W. and Arn. Prod. 280.** Quite leafless. Branchlets opposite or dichotomous, articulate, rather slender, angular, not flattened, the older branches terete. Flowers minute, in sessile clusters of 3 to 6 at the nodes, the males and females in the same clusters, each one half-immersed in a cup-shaped 2-lobed bract. Petals usually 4, very deciduous. Berry small, globular.

Queensland. Gilbert river, *F. Mueller*; Edgecombe Bay, *Dallachy*; Port Denison, *W. Hill*; Brisbane river, Moreton Bay, *A. Cunningham*, and others. Also in the mountains of the Indian Peninsula, but apparently not common there.

3. ***V. articulatum*, Burm.; DC. Prod. iv. 284.** Very much branched, forming tufts from a few in. to 1 or 2 ft. diameter. Branches flattened, articulate, sometimes forked at almost every node, sometimes elongated; the articles thick, mostly $\frac{1}{2}$ to $\frac{3}{4}$ in. long and 2 to 4 lines broad, but sometimes as broad as long or above 1 in. long and very narrow. Flowers minute, sessile and clustered at the nodes, males and females in the same clusters, the females scarcely $\frac{1}{2}$ line long, nearly globular, half-buried in a cup-shaped bract, the males still smaller. Petals usually 3, very minute, persistent and crowning the very small globular berry.—*V. moniliforme*, Blume; DC. Prod. iv. 284; Wight, Ic. t. 1018 and 1019.

Queensland. Moreton Bay, *F. Mueller*.

N. S. Wales. Liverpool Plains, *A. Cunningham*; Richmond and Clarence rivers, *Beckler*.

5. NOTOTHIXOS, Oliv.

Flowers unisexual. Calyx-border quite inconspicuous. Petals 4, rarely 3 or 5. Anthers almost sessile, at the base of the petals, not adnate, transversely 2-lobed inside, with parallel lobes obscurely locellate. Stigma sessile. Fruit a 1-seeded berry.—Parasitical dichotomous shrubs, more or less covered with

a golden or hoary tomentum, rarely at length nearly glabrous. Leaves opposite, flat, 3- or 5-nerved, but the nerves often obscure. Stipules minute, rigid, acute. Flowers minute, sessile in little pedunculate heads, solitary or several on a common terminal peduncle.

The genus is endemic in Australia. The three species distinguished by Oliver are united into one by *L. Mueller* (Fragm. ii. 109, and iv. 173). It is possible that *N. subaureus* may prove to be a remarkable variety of *N. incanus*, which is only known from specimens with imperfectly-developed inflorescence, but as yet intermediate forms have not been observed. An *N. cornifolius* appears to me in all states to be quite distinct. As in the case of *Viscum*, they are found sometimes parasites on species of *Loranthus*.

- | | |
|---|----------------------------|
| Leaves small, cuneate or spatulate. Flower-heads solitary (or in threes?). Plant hoary. | 1. <i>N. incanus</i> . |
| Leaves ovate. Flower-heads in threes. Plant more or less golden-tomentose. | 2. <i>N. subaureus</i> |
| Leaves obovate-oblong or broadly cuneate. Flower-heads in a terminal raceme. Plant hoary or nearly glabrous | 3. <i>N. cornifolius</i> . |

1. ***N. incanus***, *Oliv. in Journ. Linn. Soc.* vii. 104. Densely branched and hoary with a minute tomentum, the branchlets much flattened below the leaves, the older branches terete. Leaves oblong-cuneate or spatulate, narrowed into a petiole, very obtuse and rarely mucronulate, $\frac{1}{2}$ to $\frac{3}{4}$ in. long or rarely more, the nerves faint or inconspicuous. Flower-heads solitary (or sometimes 3 together?) on very short terminal peduncles, usually with few flowers, the females about $\frac{1}{2}$ line long, the males considerably smaller. Fruits about 3 lines long.—*Viscum incanum*, Hook. Ic. Pl. t. 73.

Queensland. Brisbane river, Moreton Bay, *Fraser, F. Mueller*.

2. ***N. subaureus***, *Oliv. in Journ. Linn. Soc.* vii. 103. Divaricately branched, the young parts and under side of the leaves densely covered with a more or less golden tomentum. Leaves ovate, obtuse, narrowed into a short petiole, mostly about $\frac{3}{4}$ to 1 in. long. Flower-heads 3, the common peduncle very short, each partial one $\frac{1}{4}$ to $\frac{1}{2}$ in. long, the lateral ones very divaricate or recurved, the flowers minute and sessile. —*Viscum subaureum*, F. Muell. in Herb. Hook.

Queensland. Brisbane river, Moreton Bay, *F. Mueller*; Ipswich, Vernet.

N. S. Wales, *C. Moore*. Blue Mountains, *Miss Atkinson*; Lake Macquarie, *Bach-house*; Twofold Bay, *F. Mueller*.

3. ***N. cornifolius***, *Oliv. in Journ. Linn. Soc.* vii. 103. A larger species than the two preceding ones, the young parts hoary-tomentose, becoming at length nearly glabrous; branches terete. Leaves obovate-oblong or oblong-cuneate, obtuse, narrowed into a short petiole, mostly $1\frac{1}{2}$ to 2 in. long. Flower-heads several, opposite, in pairs, in a terminal raceme nearly as long as the leaves, with minute bracts both under the short peduncles and under the heads. Flowers sessile in the heads, the females not $\frac{1}{2}$ line long, the males still smaller.

Queensland. Brisbane river, Moreton Bay, *A. Cunningham, Fraser*.

N. S. Wales. Port Jackson, *J. D. Hooker*; Upper Hunter river and Liverpool Plains, *A. Cunningham*; Richmond and Clarence rivers, *Beckler*.

ORDER LX. CAPRIFOLIACEÆ.

Calyx-tube adnate to the ovary, the limb short, truncate or of 4 or 5 rarely more lobes or teeth. Corolla gamopetalous, inserted round the epigynous disk; lobes 4 or 5 rarely 3, imbricate in the bud. Stamens as many as lobes of the corolla, alternate with them, inserted in the tube; anthers versatile with parallel cells opening longitudinally. Ovary inferior, 2- to 5-celled or rarely 1-celled, with 1 or more pendulous ovules in each cell. Stigmas as many as cells, or united into one, sessile or on a single filiform style. Fruit an indehiscent berry, or rarely dry, 1- to 5-celled. Seeds 1 or more in each cell. Embryo in the axis of a fleshy albumen; radicle superior, cotyledons oval or oblong.—Trees, shrubs, or climbers, rarely herbs. Leaves opposite, usually without stipules, simple or rarely pinnate.

A rather small Order, chiefly dispersed over the temperate regions of the northern hemisphere, with a very few tropical or southern species, represented in Australia by a single genus having a wide range in the northern hemisphere, and remarkable for its pinnate leaves. Many other genera scarcely differ from *Robiacea* except in the want of stipules.

1. **SAMBUCUS**, Linn.

Calyx-limb of 3 to 5 small teeth. Corolla with a very short tube, and 3 to 5 lobes, spreading so as to appear rotate. Stamens inserted at the base of the corolla. Ovary 3- to 5-celled with 1 pendulous ovule in each cell, stigma sessile, 3- to 5-lobed. Fruit a berry-like drupe, with 3 to 5 seed-like pyrenes, each containing a single seed.—Trees, shrubs, or tall herbs. Leaves opposite, pinnate. Flowers white or yellow, rather small, in large terminal corymbose cymes.

The genus is widely dispersed over Europe, temperate Asia, and North America. The Australian species are both endemic, but nearly correspond to the two commonest of the northern ones.

Shrub or tree. Leaves without stipule-like lobes. Flowers mostly

3-merous. Berries yellow 1. *S. xanthocarpa*.

Tall shrub. Lowest leaflets of each leaf close to the stem, short and broad, looking like stipules. Flowers mostly 4-merous.

Berries white 2. *S. Gaudichaudiana*.

1. ***S. xanthocarpa***, *F. Muell. in Hook. Kew Journ.* viii. 145, and in *Trans. Phil. Inst. Vict.* i. 42; *Pl. Vict.* t. 29. A tall shrub or small tree, quite glabrous. Leaflets 3 or 5, all petiolulate, the lower pair sometimes again divided into 2 or 3 each, lanceolate or ovate-lanceolate, acuminate, narrowed at the base, acutely but not deeply serrate or almost entire, mostly 2 to 3 in. long. Primary branches of the corymb umbellate, the others cymose. Flowers mostly 3-merous, rarely 4-merous, yellow (*Mitchell*). Berries yellow (*F. Mueller*).—*Triptelcus australasicus*, Lindl. in *Mitch. Three Exped.* ii. 14.

Queensland. Brisbane river, Moreton Bay, *F. Mueller*, and others.

N. S. Wales, *A. Cunningham*. Blue Mountains, *Miss Atkinson*; northward to Hastings and Clarence rivers, *Beckler*; southward to Maworra, *F. Mueller*; in the interior to Lachlan river, *Mitchell*.

2. ***S. Gaudichaudiana***, *DC. Prod.* iv. 322. Stems from a perennial stock herbaceous, erect, 3 to 5 ft. high, glabrous as well as the rest of the



Sambucus xanthocarpa . R.M.



plant. Leaflets 5 to 11, sessile or petiolulate, ovate or ovate-lanceolate, coarsely and acutely toothed, 2 to 5 in. long, the lowest of each leaf close to the stem, short, broad, and toothed, resembling leafy stipules. Primary branches of the corymb umbellate, the others cymose. Flowers mostly 4-merous. Berries oblong, white.—Hook. f. Fl. Tasm. i. 164.

Queensland. Brisbane river, Moreton Bay, *Fitzalan*.

N. S. Wales. Paramatta, *Woolfs*.

Victoria. Yarra Yarra, Cape Otway, Apollo Bay, *F. Mueller*; Portland, *Mell*.
Wendu valley, *Robertson*; Wimmera, *Dallachy*.

Tasmania. Dense shady woody ravines and alluvial flats in the northern parts of the colony, *J. D. Hooker*.

S. Australia. Mount Gambier, *F. Mueller*.

ORDER LXI. RUBIACEÆ.

Calyx-tube adnate to the ovary; the limb entire or with as many tooth lobes or divisions as lobes of the corolla, rarely more, fewer or none. Corolla gamopetalous, inserted round the epigynous disk; lobes 4, 5 or sometimes more, rarely only 3, either imbricate (often contorted) or valvate in the bud. Stamens as many as lobes of the corolla, alternating with them and inserted in the tube; anthers versatile, with parallel cells opening longitudinally. Ovary inferior, 2- or more-celled, with 1 or more ovules in each cell, rarely 1-celled with parietal placentas, or reduced to one 1-ovulate cell; style more or less divided into as many stigmatic lobes as carpels to the gynoecium, or undivided with a thickened entire or notched stigma. Fruit a capsule, drupe, berry or indehiscent nut. Seeds with a fleshy or horny albumen, and rather small straight embryo with flat cotyledons, or rarely with little or no albumen, and cylindrical embryo with semiterete cotyledons. Trees, shrubs, herbs, or rarely climbers. Leaves opposite or whorled. Stipules interpetiolar, either free or connate with the petioles in a sheath bordered by cilia or leaf-like lobes, or with one or two points on each side, or connate within the petioles in a short sheath or ring round the stem. Inflorescence various, usually more or less cymose, axillary or terminal. Flowers occasionally polygamous or unisexual, especially in *Guedhardia* and *Anthospermum*.

A very large Order, dispersed over every part of the globe; the *Cinchonæ* and *Coffeæ*, with few exceptions, tropical or subtropical; the *Stellatæ* chiefly inhabiting the more temperate or cold regions. Of the 29 Australian genera 2, belonging to *Stellatæ*, are those which have the widest range in that tribe; 2, *Acetosa* and *Coprosma*, range more or less over the extratropical or mountain regions of the southern hemisphere; 8 extend over the tropical or subtropical regions both of the New and the Old World; 6 are common to tropical Africa and Asia; 7 are limited to tropical Asia or extend into the Pacific Isles or the islands of the W. coast of Africa; 4 only are endemic in Australia, and of those 4, 3 are monotypic.

Tribe I. Cinchonæ. Leaves opposite or rarely whorled, with small or membranous stipules between or inside of them. Ovules several in each cell of the ovary.

Subtribe I. Naucleæ.—Flowers very numerous, closely packed in globular heads on a small receptacle. Ovules pendulous or imbricate on a pendulous placentæ. Fruits capsular or rarely fleshy, not pulpy.—Trees or shrubs.

Calyx connate, forming in fruit a hard fleshy mass. Petals imbricate 1. SARCOCEPHALUS.

SUBTRIBE II. Hedyotideæ.—*Flowers in cymes, clusters, or solitary. Corolla-lobes valvate. Ovules attached to an axile or basal placenta. Fruit capsular or separating into dry cocci.*—*Herbs, undershrubs, or rarely shrubs.*

Capsule ovoid or globular, or separating into hard cocci.

Flowers 4-merous. Petals entire 2. HEDYOTIS.

Flowers 5-merous. Petals 2- or 3-toothed 3. DENTELLA.

Capsule broader than long, much compressed 4. OPHIORRHIZA.

SUBTRIBE III. Gardenieæ.—*Flowers in cymes, clusters, or solitary. Corolla-lobes imbricate. Ovules attached to an axile or parietal placenta. Fruit succulent, indehiscent.*

Ovary 1-celled, with 2, 3 or more parietal prominent placentas.

Stipules connate within the petioles. Inflorescence usually terminal 5. GARDENIA.

Ovary 2-celled (rarely several-celled) with axile placentas. Stipules interpetiolar.

Flowers 5-merous.

Inflorescence axillary. Ovules imbedded in a fleshy placenta 6. RANDIA.

Corymbs terminal. Ovules not imbedded in the placenta 7. WEBBERA.

Flowers 4-merous. Ovules few (sometimes only 2 perfect) on a pettate placenta. Inflorescence axillary or terminal 8. DIPLOSPORA.

TRIBE II. Coffeeæ.—*Leaves opposite or rarely whorled, with small or membranous stipules between or inside of them. Ovules solitary or very rarely 2 collateral in each cell of the ovary, rarely several to each carpel separated by spurious septa. Cells of the fruit or pyrenes always 1-seeded.*

SUBTRIBE I. Ixoreæ.—*Corolla-lobes imbricate (usually contorted). Ovules laterally attached, usually pettate. Fruit a berry or drupe. Albumen copious.*—*Trees or shrubs* 9. IXORA.

SUBTRIBE II. Guettardeæ.—*Corolla-lobes imbricate. Ovules suspended from the summit of the normal or spurious cells. Fruit a drupe, the nucleus or pyrenes usually hard. Albumen little or none.*—*Trees or shrubs. Flowers in forked cymes or solitary, rarely umbellate.*

Uniovulate spurious cells of the ovary and pyrenes of the fruit much more numerous than the style-lobes, superposed in several series 10. TEMONIUS.

Uniovulate spurious cells of the ovary 2 to each normal cell and style-lobe, superposed, the upper ovule erect, the lower one suspended 11. SCYPHIPHORA.

Cells 1-ovulate of the same number as the style-lobes.

Corolla-tube slender, limb spreading.

Ovary 2-celled 12. ANTIRRHŒA.

Ovary several-celled.

Calyx-limb lobed 13. GUETTARDELLA.

Calyx-limb cupular, truncate, or obscurely toothed 14. GUETTARDA.

Corolla-tube ovoid, lobes very small. Flowers umbellate 15. HODGKINSONIA.

SUBTRIBE III. Vanguerieæ.—*Corolla-lobes valvate. Ovules laterally attached at or near the top. Fruit a berry-like drupe with 1-seeded pyrenes. Albumen copious.*—*Trees or shrubs.*

Flowers in axillary cymes or clusters. Ovary 2-celled 16. CANTHIUM.

SUBTRIBE IV. Psychotriæ.—*Corolla-lobes valvate. Ovules erect from the base or laterally attached below the middle. Style-lobes short. Fruit a berry-like drupe with 1-seeded pyrenes. Albumen copious.*—*Trees or shrubs.*

Flowers in globular heads, the calyx-tubes concrete or immersed in the receptacle. Ovules often twice as many as style-lobes. Fruit compound, pulpy, with 1-seeded pyrenes 17. MORINDA.

Flowers and fruits quite distinct.

Ovules and 1-seeded pyrenes 4, style-lobes 4 18. CŒLOSPERMUM.

Ovules and 1-seeded pyrenes of the same number as the style-lobes.

Ovary-cells, pyrenes, and style-lobes 4 or more. Flowers in axillary sessile clusters 19. LASIANTHUS.

Ovary-cells, pyrenes, and style-lobes 2. Flowers in terminal cymes or corymbs 20. PSYCHOTRIA.

SUBTRIBE V. **Anthospermeæ**.—*Corolla-lobes valvate. Ovules erect from the base. Style-lobes very long. Fruit a berry-like drupe. Albumen copious. Shrubs, rarely trees or herbs. Flowers often unisexual or polygamous.*

Shrubs, erect or creeping. Flowers clustered or solitary, unisexual or polygamous 21. CORBOSMA.

Slender creeping perennial herbs. Flowers solitary, hermaphrodite, or polygamous 22. NERTERA.

SUBTRIBE VI. **Operculariæ**.—*Corolla-lobes valvate. Ovules erect from the base, usually one only to each flower. Style-lobes long. Fruit capsular, 2-valved. Albumen copious.—Herbs, undershrubs, or rarely small shrubs.*

Flowers in simple or compound heads, the calyx-tubes connate. Outer valves of the fruits of each partial head connate in a persistent cup, inner valves of the same fruits connate in a deciduous operculum. .

Flower-heads connate in a compound head or rarely solitary . . . 23. OPERCULARIA.

Flower-heads several in an umbel 24. POMAX.

Flowers in a globular head, but not connate. Fruits separately 2-valved 25. ELEFTHRANTHES.

SUBTRIBE VII. **Spermacocææ**.—*Corolla-lobes valvate. Ovules variously laterally attached to the axis, the ovary usually perfectly 2-celled. Style-lobes short. Fruit capsular, or indehiscent and dry. Albumen copious.—Herbs, undershrubs, or rarely shrubs.*

Flowers in terminal cymes. Ovules attached at or near the top.

Cocci separating at the base only, falling off together, leaving a persistent subulate axis 26. KNOXIA.

Flowers in terminal heads or lateral clusters. Ovules attached at or below the middle. Capsule opening septicidally 27. SPERMACOCE.

TRIBE III. **Stellateæ**.—*Calyx wholly adnate without any visible border (in the Australian genera). Corolla-lobes valvate. Ovary 2-celled, with 1 ovule in each cell. Fruit small, indehiscent.—Herbs, rarely undershrubs. Stipules similar to the leaves, and connected with them by a short sheath or ring, forming whorls of 4 or more, very rarely (only in 2 Australian species) reduced to the 2 leaves.*

Corolla funnel-shaped, with a distinct tube 28. ASPERUJA.

Corolla nearly rotate, with scarcely any tube 29. GALIUM.

The above subtribes will be found probably to comprehend the whole of the Order, except the *Eucinchonææ* and *Rondeletiacææ*, which, numerous in tropical America, less so in Africa, Asia, and the Pacific Islands, are, as far as hitherto known, unrepresented in Australia.

TRIBE I. **Cinchonææ**.—Leaves opposite or rarely whorled, with small or membranous stipules between or inside of them. Ovules several in each cell of the ovary.

SUBTRIBE I. **Naucleæææ**.—Flowers very numerous, closely packed in globular heads on a small receptacle. Ovules pendulous or imbricate on a pendulous placenta. Fruits capsular or rarely fleshy, not pulpy.—Trees or shrubs.

This subtribe is a very natural one, although it includes genera with imbricate and with

valvate corollas, and with pedicellate as well as sessile flowers. The only Australian representative belongs to a genus somewhat anomalous in the fruits forming a compound succulent head, but very different from that of *Moriada* or of *Operecularia*, in which the calyx-tubes are connate at the base or immersed in the receptacle; whilst in *Sarcocephalus* it is the upper part of the calyx-tubes and epigynous disks that are fleshy and connate; the lower portion is often dry and never pulpy.

1. SARCOCEPHALUS, Afz.

(*Platanocarpus*, *Korth.*)

Flowers densely packed in a globular head, the calyxes cohering. Corolla-tube slender; lobes 4 or 5, spreading, slightly imbricate in the bud. Anthers nearly sessile at the mouth of the corolla-tube. Ovary 2-celled, with several linear ovules in each cell inversely imbricate on a linear placenta, pendulous from the top of the cell. Style much exerted, with 2 short stigmatic lobes. Fruits connate in a dense globular mass, fleshy when fresh, hard when dry, but capsular at the base. Seeds 1 or 2 in each cell, not winged. Albumen abundant. Trees or shrubs. Stipules interpetiolar, membranous, very deciduous. Flower-heads solitary on terminal peduncles.

The genus is spread over tropical Africa and Asia, the Australian species having a wide range in E. India and the Archipelago.

1. *S. cordatus*, *Miq. Fl. Ind. Bat.* ii. 133. A handsome tree, either quite glabrous or the leaves softly pubescent underneath. Leaves broadly ovate, obtuse, rounded, cuneate or (in specimens not Australian) broadly cordate at the base, from 4 or 5 in. to twice that length. Stipules large, broad, obtuse, but so deciduous as to be rarely seen. Flowers (yellow) in dense globular heads above 1 in. diameter without the styles. Calyx-limb shortly campanulate, with 4 or 5 stipitate clavate gland-like lobes. Corolla-tube slender, about 2 lines long; lobes about half that length, obtuse. Style very long, with a thick ovoid shortly 2-lobed stigma. Fruits united in a hard globular mass of above 1 in. diameter, pitted and rough with the remains of the more or less succulent calyxes and disks. Seeds either 1 oblong, or 2 superposed and truncate in each cell.—*Nauclea coadunata*, Sm. in Rees Cycl. xxiv.; DC. Prod. iv. 344; *N. undulata* and *N. cordata*, Roxb. Fl. Ind. i. 508, 509; *Sarcocephalus undulatus*, *Miq. Fl. Ind. Bat.* ii. 133.

IV. Australia. Glenelg river, N.W. coast, *Herb. Hooker*; Victoria river, *F. Mueller*.

Queensland. Rockhampton, *Dallachy*; Port Denison, *Fitzalan*.

The species is also in Ceylon and in the Archipelago.—*N. Bartlingii*, DC. Prod. iv. 344, or *Sarcocephalus Bartlingii*, *Miq. Fl. Ind. Bat.* ii. 133, is probably the form with pubescent leaves.

SUBTRIBE II. HEDYOTIDÆÆ.—Flowers in cymes, clusters, or solitary. Corolla-lobes valvate. Ovules attached to an axile or basal placenta. Fruit capsular or separating into dry cocci.—Herbs, undershrubs, or rarely shrubs.

This subtribe is characterized especially with reference to the genera represented in Australia, and some others nearly related to them. It is possible that it may require some modification to mark more accurately the line of separation from the *Rondeletieæ* and *Eucinchoneæ*.

2. **HEDYOTIS**, Linn.

(Oldenlandia, Linn.; Houstonia, Linn.; Metabolos, Blume.)

Calyx-limb of 4 (very rarely 5) persistent teeth or lobes. Corolla-tube short or slender, of 4 (very rarely 5) lobes, valvate in the bud. Anthers usually exerted from the tube. Ovary 2-(rarely 3- or 4-)celled, with several ovules in each cell, attached to placentas arising from near the base. Style entire or with 2 (rarely 3 or 4) stigmatic lobes. Capsule globular or ovoid, sometimes more than half-superior, the carpels separating septicidally, and indehiscent or loculicidally 2-valved, or the whole capsule loculicidally 2-valved, the valves remaining entire or splitting septicidally.—Herbs, under-shrubs, or rarely climbers. Stipules interpetiolar, united with the petioles in a short sheath or almost free, either truncate or ovate, entire or fringed with bristle-like subulate lobes.

A large genus, widely spread over tropical and subtropical Asia and Africa, with a few American species. Of the nine Australian species, one or perhaps two are common in India and the Archipelago, the others appear to be endemic.

The two Linnæan genera *Hedyotis* and *Oldenlandia* were united by Wight and Arnott, whom Torrey and Gray followed adding a third Linnæan genus *Houstonia*, and many smaller ones established by Blume and others come within the limits thus assigned to *Hedyotis*. I had subsequently thought that good characters might be found conformable to habit for separating *Hedyotis* from *Oldenlandia*. A. Gray has, however, shown that *Houstonia* is still more distinct in the seeds, but that it would require adding to it species of *Anotis* and *Hedyotis*, and that there are intermediate forms between *Hedyotis* and *Oldenlandia*, and going through all the sections it must be admitted that the adoption of the three genera would produce very unnatural groups. As, moreover, among the Australian species the three genera are represented by species having all the true *Oldenlandia* habit, it appears to be better to return to the union as proposed by Wight and Arnott and by Torrey and Gray.

Capsule hard, indehiscent or separable into 2 indehiscent cocci.

Coarse plant. Flowers numerous, in sessile axillary clusters. 1. *H. auricularia*.

Capsule slightly protruding from the calyx-tube, and opening loculicidally, or both septicidally and loculicidally. Leaves narrow-linear. Pedicels slender, solitary, or 2 or 3 together.

Slender, erect, rigid, and virgate. Corolla-lobes longer than the tube. Capsule loculicidal only. 2. *H. cœrulescens*.

Very slender, erect. Panicle loose, almost leafless. Corolla-lobes shorter than the tube. Capsule loculicidal and septicidal. 3. *H. mitrasacmoides*.

Slender and diffuse. Pedicels axillary. Corolla-lobes shorter than the tube. Capsule loculicidal and septicidal. 4. *H. galioides*.

Capsule at least half-superior, opening in 4 valves.

Corolla divided almost to the base, and often persistent. Seeds angular, or if peltate not concave. Very small much-branched annuals or perennials.

Leaves linear, mucronate-acute. Calyx-lobes mucronate-acute as long as the corolla. Annual of 2-3 in. 5. *H. scleranthoides*.

Leaves oblong, obtuse, petiolate. Flowers about 1 line long. Calyx-lobes minute, distant. Annual, under 1 in. 6. *H. elatinoides*.

Leaves linear, obtuse. Flowers about $\frac{1}{2}$ line long. Calyx-lobes obtuse, shorter than the corolla. Perennial of 2-3 in. 7. *H. tillæacea*.

Corolla-lobes shorter than the tube. Seeds broad, concave, peltately attached by a prominent rib on the inner face. Perennials with linear leaves.

Pedicels slender. Corolla-tube nearly 2 lines long. 8. *H. trachymenioides*.

Pedicels very short. Corolla-tube 1 line long. 9. *H. pterospora*.

There are also specimens of a distinct *Hedyotis* from Sturt's Creek, *F. Mueller*, but too imperfect for description.

1. ***H. auricularia***, *Link.* ; *DC. Prod.* iv. 420. A decumbent straggling herb of 1 to 3 ft., the branches hairy or pubescent all round or on the opposite sides only or almost glabrous. Leaves shortly petiolate, ovate-lanceolate to oblong-lanceolate, 1 to 3 in. long, glabrous or pubescent, with very oblique raised veins diverging from the midrib and very prominent underneath. Stipules short, with long bristle-like lobes or teeth. Flowers but little more than 1 line long, in dense axillary sessile clusters. Calyx-lobes subulate and recurved, about as long as the tube, the corolla scarcely exceeding them. Capsules small, crowned by the calyx-lobes, and quite indehiscent or rarely separating into 2 hard indehiscent cocci, each containing 4 to 6 angular seeds. —*W. and Arn. Prod.* 412 ; *Benth. Fl. Hongk.* 150 ; *H. geniculata*, *Roxb.* ; *DC. Prod.* iv. 420 ; *Metabolos venosus*, *Blume* ; *DC. Prod.* iv. 435.

Queensland. Cape York, *McGillivray*. Widely spread over E. India, the Archipelago, and the islands of the S. Pacific.

2. ***H. cærulescens***, *F. Muell. Fragm.* iv. 38. Annual (or with a perennial stock ?), with slender but rigid virgate stems of about 1 ft., quite glabrous. Leaves narrow-linear, acute, attaining sometimes 1 in. or even more. Pedicels in the upper axils, solitary or in pairs, or 3 or 4 on a common peduncle, the pedicels unequal in length, forming a very irregular loose terminal slightly-leafy panicle. Calyx-tube when in flower 1 line long, the lobes much shorter. Corolla about 1 line long, deeply 4-cleft. Fruit about 2 lines long and much narrower, laterally compressed and furrowed at the dissepiment, truncate at the top, the capsule very slightly prominent, opening loculicidally in 2 valves, not splitting septicidally. Seeds small and angular.

Queensland. Broad Sound, *R. Brown* : basaltic pastures, Mackenzie and Isaacs rivers, and Peak Downs, *F. Mueller*.—This species, the only Australian one strictly belonging to the section *Oldenlandia*, is very closely allied to the E. Indian *H. murilema*, and further specimens may possibly show it to be a variety only.

3. ***H. mitrasacmoides***, *F. Muell. Fragm.* iv. 37. A slender erect dichotomous glabrous annual of 1 ft. or more. Leaves few, narrow-linear. Stipules small, scarious, with 1 or 2 short bristle-like lobes on each side. Flowers very small, in a loose irregular 2-3-chotomous cyme or panicle, the floral leaves reduced to minute bracts. Pedicels solitary or 2 together, long and filiform. Calyx very small, with minute distant teeth. Corolla scarcely exceeding 1 line, the tube somewhat dilated upwards, the lobes rather shorter than the tube. Fruit ovoid or as broad as long, somewhat compressed, deeply furrowed at the dissepiment, $1\frac{1}{2}$ lines long. Capsule as long as the calyx-teeth, opening loculicidally and septicidally in 4 valves.

N. Australia. Depot Creek and Arnhem's Land, *F. Mueller*.

4. ***H. galioides***, *F. Muell. Fragm.* iv. 38. A slender diffuse much-branched glabrous annual. Leaves narrow-linear. Stipules very small, with 1 or 2 small bristle-like lobes on each side. Pedicels filiform, axillary, solitary or 2 or 3 together. Calyx-tube globular, contracted at the orifice, the lobes acute, nearly as long as the tube, separated by narrow acute sinuses. Corolla-tube shorter than the calyx-lobes, the lobes scarcely so long as the

tube. Fruit ovoid-globular, 1 line long or rather more, contracted at the top, furrowed at the dissepiment. Capsule scarcely protruding, the carpels separating septically at the top, and opening each in 2 valves. Seeds small, angular.

N. Australia. Along rivulets near McAdam Range, *F. Muell.*; S. Goulburn Island, *A. Cunningham.*

Queensland. Shoal Bay, *R. Brown.*, Port Curtis, *M. Gillivray.*; Cape Race and Broad Sound, *Bowman.*

The plant is undistinguishable from the slender forms of the common *H. Bornetianum* W. and Arn. (*Oldenlandia herbacea*, DC.), except by the longer connivent calyx-teeth and the capsule, which are rather those of *Hedyotis* than of *Oldenlandia*.

5. **H. scleranthoides**, *F. Muell. Fragm.* iv. 39. A divaricately-branched or diffuse glabrous annual of 2 or 3 in. Leaves linear, mucronate-acute, 3 to 4 lines long. Stipules short, usually with 2 bristle-like lobes on each side. Flowers very small, on very short pedicels, solitary or 2 together in each axil. Calyx-tube exceedingly short, broadly turbinate; lobes mucronate-acute, about $\frac{1}{2}$ line long. Corolla about as long as the calyx-lobes, divided nearly to the base. Fruit globular, scarcely $\frac{3}{4}$ line diameter. Capsule half-superior, divided to the base loculicidally and septically into 4 valves. Seeds nearly globular.

N. Australia. Depôt Creek, *F. Muell.*

6. **H. elatinoides**, *Benth.* A diffuse glabrous annual, not 1 in. long in our specimen. Leaves oblong, not 2 lines long, narrowed into a petiole. Stipules very short, entire or scarcely toothed. Pedicels slender, as long as the leaves or rather longer. Flowers scarcely $\frac{1}{2}$ line long. Calyx-tube turbinate, with small distant teeth. Corolla divided nearly to the base, and persistent as in *H. tillæacea*. Capsule $\frac{3}{4}$ line broad, half-superior, opening loculicidally and septically in 4 valves. Seeds apparently peltate.

W. Australia, *Drummond, 4th Coll.* n. 108.

7. **H. tillæacea**, *F. Muell. Fragm.* iv. 39. Perennial, much-branched, erect or diffuse, rarely exceeding 3 or 4 in., glabrous or minutely pubescent. Leaves linear or linear-oblong, mostly obtuse, rarely above $\frac{1}{2}$ in. long. Stipules small, usually with 2 teeth on each side. Pedicels axillary, not exceeding the leaves. Calyx-tube turbinate, not $\frac{1}{2}$ line long; lobes linear, herbaceous, distant, rather longer than the tube. Corolla broadly campanulate, about 1 line long, divided nearly to the base, persistent on the ripe fruit. Capsule more than half-superior, compressed, about 1 line broad, opening loculicidally in 2 valves, not usually splitting. Seeds ovate, attached by the inner face, which is sometimes broad and flat, sometimes narrow and prominent.

Queensland. Between the Mackenzie and Dawson rivers, *F. Muell.*, Suttor river, *Bowman*; plains on the lower Marnoo, *Mitchell.*

N. S. Wales. Between the Darling river and Barrier Range, *Victorian Expedition.*

S. Australia. Wills's Creek and Cooper's Creek, *Howitt's Expedition.*

8. **H. trachymenioides**, *F. Muell. Fragm.* iv. 40. Perennial, erect, with numerous dichotomous branches, slender but rigid. Leaves linear-filiform, the upper ones very short. Stipular sheaths short, entire or with 1 or

2 short bristle-like lobes on each side. Pedicels slender in the upper axils, forming sometimes an irregular panicle. Calyx-tube very short, broad, with distant teeth. Corolla-tube slender, nearly 2 lines long; lobes much shorter. Fruit $1\frac{1}{2}$ lines broad and scarcely 1 line long, compressed, furrowed at the dissepiment, the capsule half exerted, opening loculicidally in 2 valves. Seeds rather numerous, orbicular, concave, thin, peltately attached by a prominent ridge on the concave face.

Queensland. Dawson river, *P. Mueller*; Isaacs river, *Bowman*.

This and the following species agree perfectly with the N. American *Houstonia* in flower, fruit, and seed, although with the habit of *Oldenlandia*.

9. **H. pterospora**, *P. Muell. Fragm.* iv. 40. Perennial, ascending or erect, much-branched, minutely pubescent or glabrous. Leaves narrow-linear. Stipular sheaths short, with 1 or 2 short bristle-like lobes on each side. Flowers mostly nearly sessile or very shortly pedicellate along the upper branchlets. Calyx about $\frac{1}{2}$ line long, with short distant spreading teeth. Corolla-tube slender, about 1 line long; lobes shorter than the tube. Fruit about $1\frac{1}{2}$ lines broad and not nearly so long, compressed, didymous, the capsule about $\frac{2}{3}$ exerted, opening loculicidally in 2 valves. Seeds few, large, orbicular, concave, so thin as to appear like a wing to the prominent ridge on the concave face by which they are attached.

N. Australia. Sturt's Creek, *P. Mueller*.

3. **DENTELLA**, Forst.

(*Lippaya*, *Endl.*)

Calyx-limb tubular, 5-lobed, persistent. Corolla-tube somewhat dilated upwards; lobes 5, usually 2- or 3-toothed, induplicate-valvate in the bud. Anthers included in the tube. Ovary 2-celled, with several ovules in each cell, attached to a placenta arising from near the base. Style with 2 linear stigmatic lobes. Capsule globular, crowned by the calyx-limb, 2-celled, scarcely dehiscent. Seeds more or less angular. Prostrate herb. Stipules interpetiolar, entire or ciliate. Flowers solitary, sessile in the axils or forks.

The genus is limited to a single species.

1. **D. repens**, *Forst.*; *DC. Prod.* iv. 419. Stems from a perennial stock, prostrate or creeping, sometimes very small, forming dense patches of 1 or 2 in., sometimes extending to 1 or 2 ft., glabrous or hirsute with transparent almost scarious hairs. Leaves from ovate or oblong obtuse and petiolate, to lanceolate or linear and acute, under $\frac{1}{2}$ in. and often under $\frac{1}{4}$ in. long. Stipules short and scarious. Flowers sessile in the axils of the leaves or in the forks of the branches. Calyx-tube nearly globular, $\frac{1}{2}$ to $\frac{3}{4}$ lines diameter, usually very hispid; limb tubular, membranous, nearly 2 lines long, divided to about the middle into linear lobes. Corolla 2 to 3 lines long, the lobes shorter than the tube. Anthers linear. Capsule about $1\frac{1}{2}$ lines diameter, hispid with long transparent hairs.—*W. and Arn. Prod.* 405; *Lippaya telephioides*, *Endl. Atakta*, 13. t. 13.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Fitzmaurice river and Sturt's Creek, *P. Mueller*.

Queensland. Dawson river, *P. Mueller*; Port Curtis, *M. Gillarray*; Wide Bay, *Bidwill*; Moreton Bay, *C. Stuart*.

N. S. Wales. Blue Mountains, *A. Cunningham*.

S. Australia. Between Stokes Range and Cooper's Creek, *McDouall Stuart's Expedition*.

The species ranges over East India, the Archipelago, and islands of the S. Pacific.

4. OPHIORRHIZA, Linn.

Calyx-limb of 5 persistent lobes or teeth. Corolla-tube slender; lobes 5, valvate in the bud. Anthers included in the corolla-tube. Ovary 2-celled, with several ovules in each cell, attached to a placenta ascending from near the base. Style usually included, with 2 stigmatic lobes. Capsule much flattened and very broad, almost 2-lobed, opening loculicidally in 2 valves. Seeds several, angular.—Herbs or low straggling shrubs. Stipules united with the petioles in a very short truncate sheath, either entire or occasionally with 1 or 2 long hair-like points. Flowers sessile along the branches of terminal or rarely axillary pedunculate cymes.

A considerable genus, extending over tropical and eastern subtropical Asia. The only Australian species is endemic, although nearly allied to an East Indian one.

1. *O. australiana*, *Benth.* A low shrub with weak branches, the younger ones rusty-tomentose with short crisped hairs. Leaves ovate-lanceolate or elliptical, acutely acuminate, narrowed into a rather long petiole, mostly 2 to 3 in. long, but those of the same pair often unequal, sprinkled with appressed hairs on the upper side, pale underneath, with the veins more or less hirsute. Stipules with long hair-like points. Cymes pedunculate, shorter than the leaves. Bracts small, setaceous. Calyx-lobes linear, about as long as the hirsute tube. Corolla nearly glabrous outside, the tube scarcely above 1 line long, the lobes rather shorter, tomentose inside. Fruit about 3 lines broad and scarcely above 1 line long.

Queensland. Rockingham Bay, *Dallachy*. The species is nearly allied to the common Indian *O. Mungos*, which, however, appears to have the leaves always glabrous, and the corolla-lobes much shorter.

SUBTRIBE III. GARDENIÆ.—Flowers in cymes clusters or solitary. Corolla-lobes imbricate, frequently contorted. Ovules attached to an axile or parietal placenta. Fruit succulent, indehiscent.

5. GARDENIA, Linn.

Calyx-limb tubular, truncate, toothed, lobed or divided to the base into 5 or more lobes. Corolla-tube cylindrical or slightly dilated upwards; lobes 5 or more, imbricate in the bud. Anthers nearly sessile, usually more or less exserted. Ovary 1-celled, incompletely divided by 2, 3 or rarely more projecting parietal placentas, with several ovules to each placenta. Style with 2, 3 or rarely more thick erect stigmatic lobes, or nearly entire. Fruit succulent, indehiscent, usually crowned by the calyx. Seeds numerous, immersed in the fleshy or pulpy placentas.—Shrubs or trees, the young shoots often exuding a resinous gum. Stipules solitary on each side, entire, more or less connate round the stem within the petioles, and often very deciduous. Flowers usually rather large and solitary or 3 together, terminal or axillary by the non-development of the flowering-branch.

The genus is confined to the Old World, spreading over the tropical and subtropical regions of Asia and Africa. As far as hitherto observed, all the Australian species appear to be endemic.

Calyx-limb large, scarcely toothed, but splitting on one side or into 2 lobes. Plant glabrous.

Leaves under 1 in. long, narrowed at the base. Corolla-tube dilated upwards, longer than the calyx 1. *G. edulis*.

Leaves broadly ovate. Corolla-tube cylindrical, scarcely exceeding the calyx-lobes 2. *G. resinosa*.

Calyx-limb with 4 to 6 linear obtuse lobes, rarely cohering. Young shoots pubescent.

Leaves obovate or oblong, under 1½ in. Fruits under 1 in. long 3. *G. pyriformis*.

Leaves broadly ovate or orbicular, 2 to 3 in. long. Fruits 1½ to 2 in. long 4. *G. megasperma*.

Calyx-limb campanulate, truncate, with long subulate-acuminate teeth. Corolla-tube long and cylindrical.

Quite glabrous. Calyx-limb without the teeth at least 4 lines long. 5. *G. Margillieræ*.

Foliage and flowers softly pubescent or villous. Calyx-limb without the teeth not 2 lines long.

Tall shrub or tree. Leaves broadly ovate 6. *G. ochreata*.

Low shrub or undershrub. Leaves narrow, oblong 7. *G. suffruticosa*.

Calyx-teeth distinct from the base. Fruit large. Plant glabrous.

Leaves oblong, 1 to 2 in. long 8. *G. fucata*.

Leaves ovate, 3 to 4 in. long 9. *G. Jardinei*.

Calyx(villous)-limb campanulate, with short teeth. Corolla-tube short, broad; lobes acute. Pericarp thin 10. *G. chartacea*.

We have also a specimen of a distinct large-leaved species, from Mount Bremer, Cape York, *W. Hill*, but insufficient for description.

1. *G. edulis*, *F. Muell. Fragm.* i. 54. A small tree, apparently glabrous, the young shoots resinous. Leaves small, obovate or oblong, narrowed into a short petiole, very obtuse, rarely above 1 in. long. Flowers rather small, white with a green tube, solitary or 3 together and almost sessile. Calyx-limb scarcely above 2 lines long, irregularly and shortly toothed, usually splitting on one side. Corolla-tube about 4 lines long, much dilated upwards; lobes 5 or 6, oval-oblong, rather shorter than the tube. Ovary with 3 or 4 parietal placentas. Fruit nearly globular, ½ to ¾ in. diameter, crowned by the remains of the calyx-limb.

N. Australia. Gilbert river and between Flinders and Lynd river, the "Breadfruit-tree" of Leichhardt, *F. Mueller*.

2. *G. resinosa*, *F. Muell. Fragm.* i. 54. A small tree, quite glabrous, the young shoots resinous. Leaves shortly petiolate, from broadly ovate to oval-oblong, obtuse at both ends, coriaceous, pinninerved and reticulate, not exceeding 3 in. in our specimens. Flowers terminal, solitary or 3 together, shortly pedicellate. Calyx-tube contracted at the top; limb tubular-campanulate, ¾ to nearly 1 in. long, almost cartilaginous, 6-ribbed, scarcely toothed but splitting more or less into 2 lobes, especially on one side. Corolla-tube scarcely so long as the calyx; lobes 6, ovate, obtuse, 6 to 8 lines long. Placentas apparently 3. Style thickly clavate at the end with short connivent stigmatic lobes. Fruit only seen young.

N. Australia. Rocky hills, Victoria river, *F. Mueller, Bynoe*. Allied in some respects to the Indian *G. costata*, Wall., but at once known by the shorter corolla-tube.

3. **G. pyriformis**, *A. Cunn. Herb.* A shrub or tree, the specimens resembling those of *G. edulis*, but the young foliage and shoots hoary-tomentose or pubescent. Leaves obovate or oblong, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, obtuse, narrowed into a short petiole, the older ones often glabrous. Flowers terminal, solitary, shortly pedicellate, larger than in *G. edulis*. Calyx-limb very shortly tubular-campanulate, with 4 to 6 linear lobes, very variable in breadth and length, from $\frac{1}{4}$ to $\frac{1}{2}$ in. long, usually nearly equal in the same flower and quite distinct. Corolla-tube exceeding the calyx-lobes, scarcely dilated upwards; lobes broadly oblong, shorter than the tube, varying in number from 5 to 8 and often not of the same number as the calyx-lobes. Placentas 2 or 3. Fruit small, ovoid-globular or almost pear-shaped, crowned by the remains of the calyx-limb.

N. Australia. York Sound, N.W. coast, *A. Cunningham*; Victoria river, *Bignoe*.

4. **G. megasperma**, *F. Muell. Fragm.* i. 54. A shrub, with thick branches, the young shoots and buds hoary-pubescent, the older leaves glabrous or nearly so. Leaves petiolate or nearly sessile, broadly ovate or almost orbicular, very obtuse, rounded or cordate at the base, coriaceous, marked as in some other species with ciliate pits in the axils of the primary veins, but these may not be constant. Flowers terminal, solitary, nearly sessile, pubescent. Calyx-limb ribbed, 4 to 6 lines long, divided to about the middle into linear obtuse lobes, occasionally cohering; corolla-tube $\frac{3}{4}$ in. long, slightly dilated upwards; lobes 4 to 7, oblong, rather shorter than the tube. Fruits ovoid-oblong, nearly 2 in. long, crowned by the base of the calyx-limb.

N. Australia. Cambridge Gulf and Vansittart Bay, N.W. coast, *A. Cunningham*; rocky places, Victoria river, *F. Mueller*; islands of the Gulf of Carpentaria, *R. Brown*.

5. **G. Macgillivraei**, *Benth.* A small tree, quite glabrous or the calyx slightly pubescent. Leaves almost sessile, elliptical or obovate-oblong, acuminate, narrowed at the base, membranous and 3 to 4 in. long in our specimens, but still young. Flowers solitary or in threes, terminal but appearing lateral from the growing out of the new shoot, very shortly pedicellate, 6-merous. Calyx-tube ovoid, about 3 lines long; limb campanulate, at least 4 lines long, besides the long unequal subulate teeth. Corolla-tube $1\frac{1}{2}$ in. long; lobes oblong, about 1 in. Placentas (in the ovary examined) 3. Style slightly thickened at the end. Fruit (if rightly matched) hard, ovoid, $1\frac{1}{2}$ in. long.

Queensland Cape York, *M^cGillivray*, *W. Hill*. *M^cGillivray*'s specimens are in flower only, *Hill*'s in fruit only, but they appear to belong to the same species.

6. **G. ochreata**, *F. Muell. Fragm.* i. 55, and *Rep. Burdek. Exp.* 11. A large shrub or small tree, the branches, under side of the leaves, inflorescence, flowers and fruit softly pubescent or villous. Leaves shortly petiolate, broadly ovate, obtuse, 2 to 4 in. long on the flowering-branches, the upper surface minutely pubescent or at length glabrous. Flowers 6-merous, terminal, solitary or in threes, very shortly pedunculate or sessile. Calyx-limb shortly campanulate, with subulate lobes much longer than the entire part. Corolla-tube about $\frac{3}{4}$ in. long; lobes nearly as long when fully out, though much shorter when first expanding. Placentas 3. Style slightly clavate at the end, entire. Fruit ovoid or nearly globular, 1 to $1\frac{1}{2}$ in. long or rather more, said to be eatable when fresh.

Queensland. Grassy barren places, Burdekin river, *F. Muell.*; granite hills, Cape Upstart, *Fitzalan*; Mount Elliot, Edgecombe Bay, *Dallachy*.

7. *G. suffruticosa*, *R. Br. Herb.* Stems erect, under 1 ft. high, simple and leafless at the base, with 2 or 3 very short leafy branches, forming a tuft at the end. Leaves crowded, oblong, $1\frac{1}{2}$ to 3 in. long, narrowed into a very short petiole, resinous and pubescent on both sides or at least underneath. Flowers solitary and nearly sessile in the fork of the branches. Calyx pubescent; limb campanulate, about 2 lines long, truncate, with 5 or 6 linear-subulate lobes longer than the entire part. Corolla not seen but, according to Brown's MSS., the tube is pubescent, 10 to 11 lines long, with 6 lobes, the anthers included in the tube. Placentas 3. Fruit globular, pubescent, about $\frac{3}{4}$ in. diameter.

N. Australia. Gulf of Carpentaria, *R. Brown*.

8. *G. fucata*, *R. Br. Herb.* An erect branching shrub, quite glabrous. Leaves oblong, obtuse at both ends or narrowed into the very short petiole, 1 to nearly 2 in. long. Flowers solitary, terminal. Calyx-tube slender, attenuated into a short pedicel; limb divided to the base into 5 or 6 linear lobes, about 3 lines long. Corolla-tube slender, about 6 lines long; lobes 5 or 6, broad, shorter than the tube.

N. Australia. Gulf of Carpentaria, *R. Brown*. I have not dissected the flower, but from *R. Brown's* notes, as well as from the stipules and resinous shoots, there can be no doubt of its belonging to the genus.

9. *G. Jardinei*, *F. Muell. Herb.* A tree, quite glabrous. Leaves very shortly petiolate, ovate, obtuse at both ends, 3 to 4 in. long in the specimens seen. Flowers not seen, the remains of the pedicels lateral from the new shoot having grown out. Fruit ovoid, glabrous, nearly 2 in. long, crowned by the remains of 5 distinct teeth, without any prominent entire limb. Placentas 3.

Queensland. Port Denison and Mount Elliott, *Dallachy*.

10. *G. chartacea*, *F. Muell. Rep. Burdek. Exped.* 12. Shrubby, the branches slender, pubescent, with short appressed hairs. Leaves on very short petioles or nearly sessile, opposite or whorled, from elliptical-oblong to linear-lanceolate, acuminate, 3 to 5 in. long, with prominent very oblique veins, glabrous above, sprinkled with appressed hairs underneath. Stipules of *Gardenia*. Flowers nearly sessile, apparently axillary, but perhaps really terminal at the base of a new shoot. Calyx hirsute, the tube about 2 lines long; limb about the same length, with 5 short teeth. Corolla-tube broad, almost ovoid, about 3 lines long; lobes 5, lanceolate, acuminate, much longer than the tube. Placentas 2. Fruit oblong, about $\frac{3}{4}$ in. long, the pericarp thin. Seeds enveloped in pulp.

Queensland. Brisbane river, Moreton Bay, *A. Cunningham*, *F. Muell.*

N. S. Wales. Clarence river, *Beckler*; Mount Lindsay and Wilson's Creek, *Herb. F. Mueller*.

Var. (?) *latifolia*, *F. Muell.* Leaves ovate-elliptical, 4 to 6 in. long, the veins much more diverging than in *G. chartacea*. Flowers in terminal clusters, on short 3-fid peduncles, the pedicels long and villous. Calyx glabrous. Placentas 2.—Richmond river, *C. Moore*.—This has every appearance of being a distinct species, but as it is not in fruit, and the flowers,

although glabrous, are not very different in shape, I have thought it for the present safer to retain it, as proposed by F. Mueller, under *G. chartacea*.

6. *RANDIA*, Linn.

(*Stylacoryne*, *Cav.*, not of others; *Griffithia*, *W. and Arn.*; *Cupia*, *DC.*; *Gynopachys*, *B.*)

Calyx-limb tubular campanulate or annular, truncate toothed or lobed. Corolla-tube cylindrical, short or long, rarely dilated at the top; lobes 5, imbricate (usually contorted) in the bud. Anthers nearly sessile, included in the tube or exerted. Ovary 2-celled, with several, usually numerous, ovules in each cell, attached to a fleshy peltate placenta. Style with 2 thick stigmatic lobes or entire. Fruit succulent, indehiscent, often crowned by the calyx-limb. Seeds several, immersed in the fleshy or pulpy placenta. Shrubs or rarely trees, often, especially in species not Australian, armed with opposite axillary thorns. Stipules interpetiolar, solitary on each side, pointed, with a broad base but not united, often deciduous. Flowers in axillary cymes or clusters, or solitary at the summit of short branches or tufts of leaves.

A considerable genus, dispersed over the tropical regions of the New and the Old World.

- | | |
|---|---------------------------|
| Often thorny. Flowers solitary, pedicellate. Corolla-tube cylindrical, longer than the lobes | 1. <i>R. Moorei</i> . |
| Unarmed. Flowers few, in very loose cymes. Corolla-tube oblong, nearly as long as the lobes | 2. <i>R. Fitzalani</i> . |
| Unarmed. Flowers numerous in dense leaf-opposed cymes. Corolla-tube much shorter than the lobes | 3. <i>R. densiflora</i> . |

There are specimens also in R. Brown's collection of a shrub from Torres Straits, apparently very nearly allied to *Randia triflora*, but scarcely sufficient for accurate description.

1. *R. Moorei*, *F. Muell. Herb.* A shrub of 8 ft. (*C. Moore*), quite glabrous, producing axillary thorns, very small and few in the specimen, but probably sometimes large. Leaves ovate, $1\frac{1}{2}$ to 3 in. long, on short petioles. Stipules broad, with acute points. Pedicels axillary, slender, solitary, 1 to 4 lines long, 1-flowered, with a pair of small bracteoles at the end. Calyx about 2 lines long, the limb campanulate, truncate, obscurely toothed. Corolla-tube about 4 lines long, cylindrical, slightly dilated at the orifice; lobes 5, obtuse, not quite so long as the tube. Fruit not seen.

N. S. Wales. Tweed river, *C. Moore*. A single specimen in Herb. F. Mueller, apparently very nearly allied to the E. Indian *R. (Griffithia) fragrans*, *W. and Arn.*

2. *R. Fitzalani*, *F. Muell. Herb.* An unarmed tree, quite glabrous. Leaves obovate-oblong or elliptical, obtuse, narrowed into a rather long petiole, often above 6 in. long, smooth and shining. Stipules lanceolate, very deciduous. Cymes loose, few-flowered or the fertile flowers almost solitary, axillary at the base of the young shoot, appearing terminal before the branch grows out. Flowers half dioecious, the males with semiabortive ovaries, the females with imperfect stamens. Calyx-limb campanulate, truncate, nearly 3 lines diameter. Corolla-tube oblong, 4 to 6 lines long, slightly contracted at the orifice; lobes oblong, about as long as the tube or rather longer. Anthers long-linear, included in the tube. Style slightly thickened in the middle, with 2 short linear lobes. Fruit hard, globular and $1\frac{1}{2}$ in. diameter, or ovoid and longer.—*Gardenia Fitzalani*, *F. Muell. Rep. Burdek. Exped. 12.*

Queensland. Cape Upstart, Magnetic Island, etc., *Burdekin Expedition*; Endeavour river, *W. Hill*. Broad Sound, *Bowman*; Rockingham Bay, *Dallachy, W. Hill*.

3. *R. densiflora*, *Benth. Fl. Hongk.* 155. An unarmed shrub, glabrous except sometimes the flowers. Leaves oval-oblong or almost lanceolate, coriaceous, shining, 4 to 5 in. long. Flowers rather crowded in shortly pedunculate or almost sessile cymes, really axillary, although they appear leaf-opposed by the abortion of the subtending leaf. Calyx-limb cup-shaped, obscurely toothed. Corolla-tube about 1 line long, very hairy inside at the orifice; lobes oblong, nearly 3 lines long. Anthers exserted. Style linear, much exserted, the lobes not separating spontaneously. Berries small and globular or larger and ovoid. Seeds ovoid, compressed or angular, more or less immersed in the pulpy placenta.—*Copia densiflora*, DC. Prod. iv. 394, and other synonyms quoted *Fl. Hongk. l. c.*; *Lorou Thozetiana*, F. Muell. Fragm. ii. 132.

N. Australia. Gulf of Carpentaria, *R. Brown* (from his MS.).

Queensland. Northumberland Island, *R. Brown*; Port Denison, *Thozet, Dallachy*; Rockingham Bay and Rockhampton, *Dallachy*.

The species is common in the Eastern Archipelago. It is evidently closely allied to *Stylacorne racemosa*, Cav., from the Philippine Islands, which I think should include *S. coffeoides*, A. Gray, as originally proposed by Hooker and Arnott. *Gyrlithoa Gardneri*, Thw. Frum. Pl. Ceyl. 158, from Ceylon, is scarcely to be distinguished specifically from *R. densiflora*. *Stylacorne Harveyi*, A. Gray, from the Fiji islands, is rather more distinct, but yet belonging to the same group of closely allied species.

7. WEBERA, Schreb.

(*Stylacoryne, W. and Arn. and others, not of Cav.*)

Calyx-limb short, truncate or 5-toothed, deciduous. Corolla-tube cylindrical; lobes 5, imbricate (usually contorted) in the bud. Anthers nearly sessile, more or less exserted. Ovary 2-celled with several ovules in each cell, attached to a peltate placenta. Fruit a globular berry. Style long, slightly thickened upwards, undivided. Seeds angular, without any or with a very thin pulp.—Shrubs or trees, without thorns. Stipules solitary on each side, pointed, with a broad base but not united. Flowers not usually numerous, in broad terminal cymes or corymbs.

The species are scattered over tropical Africa, Asia, and the S. Pacific islands. The Australian species is apparently endemic, although very closely allied to a common one in the S. Pacific.

1. *W. Dallachiana*, *F. Muell. Herb.* A tree of 20 to 30 ft. (*Dallachy*). Leaves petiolate, oval elliptical or oblong, acuminate, narrowed at the base, often 6 to 8 in. long. Flowers very numerous in a terminal trichotomous corymb shorter than the leaves. Calyx very small, the limb short, cup-shaped, obscurely toothed. Corolla-tube slender, about 5 lines long; lobes oblong, less than half the length of the tube; anthers linear. Style very long.

Queensland. Albany Island, *W. Hill*, Rockingham Bay, *Dallachy*.—In fruit and foliage the species is undistinguishable from the common *W. sandwicensis* (*Pavetta*, DC., *Stylacoryne*, A. Gray) of the Fiji and other Pacific islands, and the specimens have a similar tendency to dry black; the only difference I can detect is in the corolla-tube fully twice as long, but this appears to be constant.

8. DIPLOSPORA, DC.

(Discospermum, Dalz.)

Calyx-limb short, 4-toothed or truncate. Corolla-tube short, lobes 4, spreading, imbricate in the bud. Anthers exserted. Ovary 2-celled, with 2 or more ovules in each cell, attached to a small peltate placenta. Style with 2 stigmatic lobes. Fruit a globular berry. Seeds solitary or few in each cell.—Trees or shrubs. Stipules interpetiolar, pointed, with a broad base. Flowers in axillary clusters or close cymes, or in pairs of clusters with one terminal one, forming a short terminal raceme.

Besides the Australian species, which is endemic, the genus comprises 3 or 4 from tropical Asia.

1. *D. australis*, Benth. A small glabrous tree. Leaves ovate or elliptical, shortly and obtusely acuminate, narrowed into a short petiole, 2 to 3 in. long, coriaceous and shining. Stipules triangular, acute, deciduous. Peduncles 3 or 5 in a short terminal raceme, the lateral ones opposite in pairs, divaricate, each with 3 flowers sessile within a pair of concave bracts. Flowers altogether not 2 lines long. Calyx-limb cup-shaped, with 4 short rounded teeth or lobes. Corolla-tube very short and broad; lobes 4, much longer than the tube. Ovules about 3 to each placenta. Style short with oblong stigmatic lobes.

Queensland. Cape York, *W. Hill, M'Gillivray*.—The structure of the flower and ovary is precisely that of *D. viridiflora*, DC., although the inflorescence is so different. In both species at the time of flowering there are only 2 or 3 comparatively large perfect ovules in each cell, accompanied generally by 2 or 3 minute abortive ones which in some flowers are more perfect. *Discospermum*, Dalz., with the inflorescence and most of the characters of *D. viridiflora*, differs slightly, in both its species, in the ovules, but nevertheless the whole ought, as suggested by Thwaites, to be included in one genus.

TRIBE II. COFFEEÆ.—Leaves opposite or rarely whorled, with small or membranous stipules between or inside of them. Ovules solitary or very rarely 2 collateral in each cell of the ovary, rarely several to each carpel separated by spurious septa. Cells of the fruit or pyrenes always 1-seeded.

SUBTRIBE I. IXOREÆ.—Corolla-lobes imbricate, usually contorted. Ovules laterally attached, usually peltate. Fruit a berry or drupe. Albumen copious. Trees or shrubs.

The aestivation of the corolla is the most important character of this subtribe, which only differs from the smaller-fruited *Gardenieæ* in the solitary ovules. The peltate attachment of the ovules may not be quite constant even in the genus *Ixora*.

9. IXORA, Linn.

(Pavetta, Linn.)

Calyx-limb small, 4-toothed or lobed (rarely 5-toothed). Corolla-tube slender; lobes 4 (rarely 5), imbricate in the bud, usually contorted. Anthers usually exserted. Ovary 2-celled, with 1 ovule in each cell, peltately attached to the centre of the partition or rarely near the base. Style exserted, entire or divided at the end into 2 stigmatic lobes. Fruit a small globular berry or drupe, the endocarp not hard, forming 2 1-seeded pyrenes. Seeds broad,

with the inner face flat or more frequently very concave.—Shrubs or small trees. Stipules interpetiolar, pointed, their broad bases often connate within the petioles. Flowers in terminal dense or large corymbs or panicles, or, in species not Australian, in smaller axillary or lateral cymes.

A large genus, widely dispersed over tropical Asia and Africa, with a few tropical American species. Of the seven Australian species three are common in E. India and the Archipelago, another extends at least to Timor, and the remaining three appear to be endemic, and very unlike any Asiatic species. The two Linnæan genera *Leora* and *Pavetta* have been generally distinguished by the style,—2-lobed in *Leora*, simple in *Pavetta*, but owing to there being several species where the lobes rarely spread, and the stigma being really compound in all, Roxburgh, Korthals, Miquel, and others have united the two genera, and, as A. Gray appears to think there are good grounds for the union, I have followed their example. There are great differences in the form of the seeds in different species, but, as far as known, these do not coincide with differences in the style. How far the seeds may be made available for sectional distinction remains to be seen when those of more species shall have been observed.

SECTION I. **Pavetta**.—Flowers 4-merous. Style slender, simple, or the lobes not separating.

- Leaves glabrous, usually narrow 1. *I. Pavetta*.
Leaves pubescent, at least underneath, usually broad 2. *I. tomentosa*.

SECTION II. **Ixora**.—Flowers 4-merous. Style-lobes usually spreading.

- Cymes dense, sessile. Corolla-tube $1\frac{1}{2}$ in. long; lobes acute, $\frac{1}{4}$ the length of the tube 3. *I. coccinea*.
Panicles loose. Corolla-tube 3 to 4 lines long; lobes oblong, nearly as long as the tube 4. *I. Timorensis*.
Corymb rather dense, sessile. Corolla-tube $1\frac{1}{2}$ lines long; lobes about the same length 5. *I. Becklerii*.
Peduncles very short, clustered, each with 3 sessile flowers. Corolla not 2 lines long, the tube very short. Leaves small, coriaceous, and shining 6. *I. triflora*.

SECTION III. **Pentadium**.—Flowers 5-merous.

- Corymb rather dense, sessile. Corolla-tube about 1 line; lobes about 3 lines long 7. *I. pentamera*.

SECTION I. **PAVETTA**.—Flowers 4-merous. Style slender, simple, or the lobes not separating, usually very long. Specimens usually drying black. Flowers in sessile corymbs.

1. **I. Pavetta**, *Rowb. Fl. Ind. i.* 385. A tall shrub or small tree, glabrous or slightly pubescent. Leaves petiolate, oval-oblong or almost lanceolate, acute or acuminate, 3 to 4 in. long, narrowed at the base. Stipules very shortly acuminate, connected at the base within the petioles. Corymb loosely trichotomous, sessile above the last leaves. Calyx about 1 line long; limb loosely campanulate with minute teeth. Corolla-tube 4 to 5 or rarely 6 lines long; lobes oblong, much shorter. Fruits 2 to 3 lines diameter. Seeds hemispherical, very concave on the inner face.—*Pavetta indica*, Linn.; W. and Arn. *Prod.* 431; Wight, *lc. t.* 148.

Queensland. East coast, *R. Brown*; Burdekin river, *F. Mueller*; Port Denison, *Fitzalan*; Edgecombe Bay, *Dallachy*; Curtis island, *Henne*; Rockhampton, *Thozet*; Brisbane river, Moreton Bay, *A. Cunningham*, *F. Mueller*, and others. The species is widely spread over E. India and the Archipelago.

2. **I. tomentosa**, *Rowb. Fl. Ind. i.* 386. A tall shrub or tree, closely

allied to *I. Pavetta*. Leaves rather broader and more obtuse, softly pubescent on both sides when young, rarely becoming glabrous above when old. Corymbs more dense than in *I. Pavetta*, the whole inflorescence and calyxes tomentose or hoary pubescent. Calyx-limb small, with minute teeth. Corolla fruit and seeds of *I. Pavetta*.—Wight, Ic. t. 186; *Pavetta tomentosa*, Sm.; W. and Arn. Prod. 431.

N. Australia. Carcening Bay, N. W. Coast, *A. Cunningham*; Victoria river, *F. Mueller*, *Bynoe*; N. Coast, *R. Brown*.—Not so common in India as *I. Pavetta*. The Australian specimens quite agree with the ordinary Indian ones, both wild and from the Calcutta Botanic Garden. The Ceylon plant, designated by the same name in Thwaites's Enumeration, differs, as remarked by him, in the long narrow calyx-lobes, and is probably a distinct species.

SECTION III. IXORA.—Flowers 4-merous. Style with 2 stigmatic lobes usually spreading, rarely remaining coherent in species not Australian.

3. ***I. coccinea*, Linn.**; *W. and Arn. Prod.* 427. A tall glabrous shrub. Leaves nearly sessile, from oval or oblong with a more or less cordate base to cuneate-obovate, obtuse and mucronulate, or acute or shortly acuminate, rarely exceeding 3 in. on the flowering branches. Stipules with a fine subulate point from a broad base, shortly connate within the petioles. Cymes forming a dense corymb, nearly sessile above the last leaves, almost contracted into a head. Flowers orange-red. Calyx-limb acutely 4-lobed. Corolla-tube at least $1\frac{1}{2}$ in. long; lobes acute, not above 4 lines long. Seeds hemispherical, very concave on the inner face.—Wight, Ic. t. 153 (not Bot. Mag. t. 169); *I. grandiflora*, Ker, Bot. Reg. t. 154; Wight in Hook. Bot. Misc. iii. 294. t. suppl. 35.

N. Australia. Port Essington, *Armstrong*.—Extends from Ceylon and the Indian Peninsula to the Archipelago. Although the specimens were gathered as part of the native vegetation, it is possible that this may have been one of the exotic shrubs planted during the time that Port Essington was colonized.

4. ***I. Timorensis*, Dene. Herb. Tim. Descr.** 90. A small tree, quite glabrous. Leaves shortly petiolate, oval-oblong or oblong-elliptical, obtuse, acute, or shortly acuminate, or rarely ovate-lanceolate, 4 to 8 in. long, the uppermost floral pair occasionally but rarely sessile and cordate. Stipules shortly connate within the petioles. Flowers white, in large loose terminal panicles more or less pyramidal or rarely almost corymbose, all pedicellate or a few sessile in the last forks. Calyx small, the short limb truncate or obscurely toothed. Corolla-tube 3 to 4 lines long, slender, hairy inside at the orifice; lobes narrow-oblong, nearly or sometimes quite as long as the tube. Fruit globular, 2 to 3 lines diameter. Seeds not seen.—*I. Klanderiana*, F. Muell. Fragm. v. 18.

N. Australia. North coast, *R. Brown*; Port Essington, *Armstrong*.

Queensland. Cape York and neighbouring islands, *McGillivray*, *W. Hill*; Rockingham Bay, *Dallachy*.

The species extends to Timor, and possibly to other islands of the Archipelago. The only one among the E. Indian ones to which it can be compared is *I. undulata*, Roxb., which has a similar foliage and inflorescence as well as corolla, but the calyx-limb in that as in most Indian species is deeply toothed.

5. ***I. Becklerii*, Benth.** A tall shrub or small tree, quite glabrous.

Leaves ovate or elliptical, shortly acuminate, narrowed at the base, 3 to 4 in. long, smooth and shining. Stipules connate within the petioles, with fine subulate points. Corymbs rather dense, sessile and much shorter than the leaves. Calyx-limb short, irregularly toothed. Corolla-tube about $1\frac{1}{2}$ lines long; lobes 4, about as long as the tube, acute. Style-lobes short, linear. Fruit 3 to 4 lines diameter. Seeds (not seen quite ripe) hemispherical, the inner face not concave, the testa wrinkled, but the albumen not ruminant.

N. S. Wales. Richmond and Clarence rivers, *Beckler*.

6. *I. triflora*, R. Br. Herb. A glabrous shrub with dichotomous branches. Leaves ovate or elliptical-oblong, obtuse or scarcely acuminate, shortly narrowed into the petiole, 1 to $1\frac{1}{2}$ in. long, very coriaceous, smooth and shining. Stipules membranous, short, broad, and deciduous. Peduncles very short, in little terminal clusters, each with 3 to 5 very small sessile flowers. Calyx-limb short, obscurely toothed. Corolla not 2 lines long, glabrous inside; lobes 4, longer than the tube. Anthers exserted. Style shortly 2-lobed. Fruit small, ovoid, smooth. Seeds hemispherical, rugose, the inner face not concave, but not seen very perfect.

Queensland. East coast, *R. Brown*; Broad Sound, *Bowman*; Rocklampton, *Thozet*, *Dallachy*.—Very unlike any other *Ixora* known to me, but the ovules and the aestivation of the corolla are those of the genus.

SECTION III. PENTADIUM.—Flowers 5-merous. Style undivided.

7. *I. pentamera*, Benth. A shrub of 5 to 10 ft., the branches and inflorescence minutely hoary-pubescent. Leaves petiolate, oval-elliptical, 4 to 6 in. long, coriaceous, smooth and shining. Stipules broad, slightly connate within the petioles, deciduous. Flowers small in a nearly sessile rather dense corymb like that of *I. Becklerii*. Calyx pubescent; limb short, with 5 broad rounded short lobes or teeth. Corolla glabrous, the tube about 1 line, the lobes oblong, about 3 lines long. Anthers long-linear, exserted. Style long, slightly thickened towards the end, entire.—Fruit ovoid-globular, crowned by the calyx-limb, about 3 lines diameter. Pyrenes smooth. Seeds hemispherical, the inner face not concave, but the albumen ruminant as in the section *Grumilia* of *Psychotria*.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.—In the only flower examined, the ovules appeared to be attached near the base, but the aestivation of the corolla is much contorto-imbricated.

SUBTRIBE II. GUETTARDEÆ.—Corolla-lobes imbricate, not contorted. Ovules suspended from the summit of the normal or spurious cell (except in the upper cells of *Scyphiphora*). Fruit a drupe, the nucleus or pyrenes hard. Seeds attached by a thickened funiculus usually closing the orifice of the pyrene or cells of the nucleus. Albumen little or none. Embryo nearly terete, the cotyledons semiterete and scarcely broader than the radicle.—Trees or shrubs. Flowers in forked cymes, rarely in umbels, or when polygamous the females often solitary.

The exceptional characters of this subtribe have been well pointed out by A. Gray ('Notes on some *Rubiaceæ*'), except that it is much to be doubted whether it includes any genus with really valvate corolla-lobes.

10. **TIMONIUS**, Rumph.

(Polyphragmon, Desf.)

Calyx-limb truncate or irregularly toothed. Corolla-tube cylindrical; lobes 4 or more, short, thick, obtuse, with a central rib prominent inside, the margins more or less imbricate in the bud. Anthers included in the tube. Ovary (normally 5- to 10-celled with several ovules to each cell) divided by spurious dissepiments between the ovules into very numerous 1-ovulate cells, superposed in several irregular rows. Style divided into about 5 to 10 linear lobes. Fruit a drupe, with exceedingly numerous oblong-linear 1-seeded pyrenes, closely packed and diverging in many rows from the axis. Seeds of *Guettarda*.—Trees or shrubs. Stipules membranous, so deciduous as to be rarely seen. Flowers polygamo-dioecious, on axillary peduncles, the females (with small or imperfect stamens) usually solitary, the males (with an abortive ovary) 3 or more together, sessile in the forks or along the branches of pedunculate cymes.

The genus consists of a few species, dispersed over the Archipelago and islands of the South Pacific, the Australian species extending to Sumatra and Amboyna. The peculiar seed of this and other *Guettardæ* has been very accurately described by A. Gray in the above-mentioned notes. I do not find, however, that *Timonius* is so exceptional in the aestivation of the corolla as it appeared to him, but it is difficult to observe. In the bud the lobes adhere so closely as to require much soaking to open them without tearing, and, when open, they are so thick as to convey the idea that they must have been valvate. But, on examining buds just ready to burst, I have found the margins overlapping, both in *T. Rumphii* and *T. Forsteri*.

1. **T. Rumphii**, DC. *Prod.* iv. 461. A tall shrub or small tree, either glabrous except the inflorescence, or the young shoots silky-hairy, and the older leaves sprinkled with long soft hairs. Leaves from ovate-elliptical to oblong-lanceolate, acuminate, narrowed into a petiole, mostly 3 to 5 in. long. Male flowers several in a forked cyme. Calyx-limb tubular, 2 to nearly 3 lines long, truncate or irregularly toothed, the ovary quite abortive. Corolla tomentose, the tube about 4 lines long; lobes 4 to 10, oblong-linear, rather more than half as long as the tube. Style rudimentary. Female flowers solitary, resembling the males, except that the stamens are small and the ovary perfect, the 1-ovulate cells exceedingly numerous. Style with about 5 to 10 linear unequal lobes. Fruit globular, about $\frac{1}{2}$ in. diameter, crowned by the calyx-limb. — *Polyphragmon sericeum*, Desf. in *Mem. Mus.* vi. t. 2; DC. *Prod.* iv. 445; *Guettarda polyphragmoides*, F. Muell. *Fragm.* ii. 134.

N. Australia. Careening Bay, N.W. coast, *A. Cunningham*; Upper Victoria and Fitzmaurice rivers, *F. Mueller*; Port Essington, *Armstrong*; Sweers Island, *Heene*; Upper Lynd river, *Leichhardt*.

Queensland. Cape York, *McGillivray*; Percy Islands, *A. Cunningham*; Rockingham Bay, *W. Hill*; Rockhampton, *Dallachy* and others.

The species is also in Timor, Amboyna, Sumatra, and probably in other islands of the Archipelago.

11. **SCYPHIPHORA**, Gærtn.

(Epithinia, Jack.)

Calyx-limb truncate or minutely toothed. Corolla-tube cylindrical or slightly dilated upwards; lobes 4 or rarely 5, imbricate in the bud. Anthers linear-sagittate, exserted. Ovary really 2-celled, but each cell divided by a

spurious dissepiment into 2 superposed ones, with one ovule in each, the upper ovule erect, the lower one pendulous. Style filiform, with 2 short linear stigmatic lobes. Fruit a drupe with a hard endocarp scarcely separable into pyrenes, with 1 1-seeded cells superposed in pairs, or fewer by abortion. Seeds of *Guettarda*.—Shrub. Stipules interpetiolar, broad and short. Flowers in small pedunculate axillary cymes.

The genus consists of a single species, extending from Ceylon over the Indian Archipelago.

1. **S. hydrophylacea**, *Gartn.*; *DC. Prod.* iv. 577. A shrub of several feet, quite glabrous, the young shoots resinous. Leaves obovate, very obtuse, narrowed into a rather long petiole, $1\frac{1}{2}$ to nearly 3 in. long, coriaceous smooth and shining. Cymes dense, very shortly pedunculate. Corolla-tube $1\frac{1}{2}$ to nearly 2 lines long, hairy inside at the orifice; lobes ovate-oblong, rather obtuse. Drupe oblong, crowned by the calyx-limb, longitudinally ribbed and furrowed, 3 to 4 lines long. Albumen present but very scanty.—*Epithinia Malayana*, *Jack.*; *DC. Prod.* iv. 478.

Queensland. Albany Island, Cape York, *M'Gillivray, W. Hill.*

The species appears to be common on the coasts of Ceylon, of the islands of the Archipelago, and of the Malayan Peninsula. The figures and descriptions of *Gartner*, Pr. iii. 91. t. 196, and of *A. Rich* in *Mém. Soc. Hist. Nat.* v. 159. t. 14, are incorrect in many particulars. The only accurate account of the structure of the ovary and fruit I am aware of is that of *A. Gray*, *Not. Rub.* 19.

12. ANTIRRHÆA, Juss.

Calyx-limb 4-lobed. Corolla-tube slender; lobes 4, imbricate in the bud. Anthers included in the tube. Ovary 2-celled, with 1 pendulous ovule in each cell. Style filiform with 2 short linear stigmatic lobes. Fruit a drupe, the nucleus hard, separating into 2 1-seeded pyrenes. Seeds of *Guettarda*.—Shrubs or trees. Stipules interpetiolar, acuminate, deciduous. Flowers often polygamous, sessile on the branches of a forked cyme or the females solitary, on axillary peduncles.

The genus comprises several species from the Mauritius and Madagascar; one is quoted from Sumatra, and it may possibly include the *Chomelia* from the Sandwich Islands, described by *A. Gray*. The Australian species appears to be endemic, but I have not had the opportunity of comparing it with *Korthals' A. strigosa* from Sumatra. The genus is perhaps too closely allied on the one hand to *Chomelia*, and on the other to *Guettarda* and *Guettardella*.

1. **A. tenuiflora**, *F. Muell. Herb.* A shrub or tree, glabrous or the young parts silky-pubescent. Leaves oval-elliptical, acuminate, narrowed into a petiole, 3 to 6 in. long, membranous, glabrous above, the underside often sparingly pubescent. Peduncles axillary, forked, with several sessile flowers along the branches. Calyx scarcely 1 line long, the lobes short and spreading. Corolla nearly glabrous, the slender tube between 4 and 5 lines long, the lobes ovate, about 1 line. Fruit not seen.

Queensland. Rockingham Bay, *Dallachy*.

13. GUETTARDELLA, Champ.

Calyx-limb deeply 4- to 6-lobed. Corolla-tube slender; limb 4- to 6-lobed, imbricate in the bud. Anthers included in the tube. Ovary 4- to 6-

6-celled, with 1 pendulous ovule in each cell. Style divided at the top into as many linear lobes as cells to the ovary. Fruit a drupe, the hard putamen with 4 to 6 1-seeded cells or separating into as many pyrenes.—Seeds of *Guettarda*, the albumen thin or none.—Shrubs usually slender. Stipules interpetiolar, broad, pointed. Flowers rather small, probably polygamous, sessile on the branches of a forked axillary pedunculate cyme or solitary.

A small genus, containing besides the single Australian species which is endemic, one from the Philippine Islands and one from S. China. It differs slightly from *Guettarda* and *Bobea* in the slender habit and in the calyx, and from *Antirrhæa* and *Chomelia* in the parts of the gynæcium more than two.

1. *G. putaminosa*, Benth. Apparently shrubby, much-branched, slender, glabrous or the young parts silky-pubescent. Leaves from obovate to oblong, very obtuse, narrowed into a short petiole, rarely above 1 in. long and mostly smaller, smooth and shining. Peduncles slender, axillary, bearing either 1 or a cyme of 3 flowers, only seen in an advanced state. Calyx-lobes small, obtuse. Corolla-tube very slender, about 2 lines long, silky-pubescent; lobes 4 to 6, very obtuse, about $\frac{1}{2}$ line long and broad. Drupe ovoid or oblong, about 3 lines long, glabrous, the putamen hard, 5- or 6-celled, or (when not quite ripe?) separating into as many pyrenes.—*Bobea putaminosa* or *Timonius putaminosus*, F. Muell. Fragm. iv. 92.

Queensland. Rockhampton, Thozet.

14. GUETTARDA, Linn.

Calyx-limb truncate or irregularly toothed. Corolla-tube cylindrical; lobes 4 or more, imbricate in the bud. Anthers included in the tube. Ovary 4- or more-celled, with 1 pendulous ovule in each cell; style with as many linear lobes as cells of the ovary. Fruit a drupe, with a hard several-celled nucleus. Seeds solitary in each cell, oblong, cylindrical or curved, funiculus thick, closing the orifice of the cell; testa thin; albumen none or very thin; embryo the shape of the seed, the cotyledons not broader than the superior radicle.—Trees or shrubs often tomentose. Stipules interpetiolar, broad, acuminate, deciduous. Flowers sessile along the branches of a forked cyme, pedunculate in the axils.

The genus is spread over the tropical regions of both the New and the Old World. The only Australian species is common on seacoasts from Eastern Africa to the Pacific.

1. *G. speciosa*, Linn.; DC. Prod. iv. 455. A coarse shrub, attaining 5 or 6 ft., the young branches thick, often flattened, gummy and glabrous or tomentose. Leaves shortly petiolate, broadly obovate-orbicular or ovate, very obtuse, rounded or slightly cordate at the base, 6 to 10 in. long or even more, glabrous above, softly pubescent tomentose or nearly glabrous underneath. Flowers large, in rather dense cymes. Calyx-limb truncate, deciduous, 1 to $1\frac{1}{2}$ lines long. Corolla-tube above 1 in., sometimes $1\frac{1}{2}$ in. long; lobes 4 to 9, oblong, obtuse, not $\frac{1}{2}$ in. long. Ovary-cells 4 to 9, usually 5 or 6. Drupe nearly globular, attaining 1 in. diameter, chiefly consisting of the very hard woody endocarp, more or less lobed, the interstices filled with a hard fibrous mesocarp, the cells and seeds small and curved.—Wight, Ic. t. 40; Bot. Reg. t. 1393.

N. Australia. Port Essington, *Armstrong*.

Queensland. Torres Straits, *R. Brown*, and along the coast and adjoining islands from thence to Edgcombe Bay and Port Denison, *F. Mueller*, *W. Hill*, and others.

15. HODGKINSONIA, F. Muell.

Calyx-limb minute, 4-toothed. Corolla-tube ovoid; lobes 4, very short, obtuse (slightly imbricate?). Anthers included, the filaments inserted near the base of the corolla-tube. Ovary 2- to 4-celled, with 1 pendulous ovule in each cell; style with as many linear-lobes as ovary-cells. Fruit a drupe, with a thick hard 2- to 4-celled putamen. Seeds of *Guettarda*, the albumen present but scanty.—Tree. Stipules interpetiolar, acuminate, very deciduous. Flowers polygamo-dioecious, umbellate, on slender axillary peduncles.

The genus consists of a single species, endemic in Australia, allied in several respects to *Guettardella*, but with a different inflorescence and corolla.

1. *H. ovatiflora*, *F. Muell. Fragm.* ii. 132. A tree with slender branches, glabrous or the young shoots with a few appressed hairs. Leaves petiolate, elliptical or ovate, obtuse or obtusely acuminate, narrowed at the base, the veins not prominent, $1\frac{1}{2}$ to 3 in. long. Peduncles slender, shorter than the leaves, bearing either a single umbel, or also a pair of lateral branches each with an umbel, each umbel on the male plant with 10 to 12 flowers, on the female with only 3 to 6. Pedicels short. Calyx-limb very small. Corolla in the males ovoid, almost urceolate, fully 2 lines long, the lobes very short, thick, and obtuse, the ovary abortive. Corolla in the females much smaller and nearly globular; anthers small; style short. Drupe small, ovoid or globular.

Queensland. Wide Bay, *Bidwill*; Rockhampton, *Dallachy*; Brisbane river, Moreton Bay, *Fraser*, *F. Mueller*.

N. S. Wales. Clarence and Richmond rivers, *Beckler*.

SUBTRIBE III. VANGUERIEÆ.—Corolla-lobes valvate. Ovules laterally attached at or near the top. Fruit a berry-like drupe with 1-seeded pyrenes. Albumen copious.—Trees or shrubs.

16. CANTHIUM, Lam.

Calyx-limb short, more or less toothed. Corolla-tube short or cylindrical; lobes 4 or 5, valvate in the bud. Anthers exerted or rarely included in the tube. Ovary 2-celled, with 1 ovule in each cell, laterally attached near or at the top. Style exerted, with a thick ovoid or mitre-shaped entire or 2-lobed stigma. Fruit a globular compressed or didymous drupe, with 1 or 2 one-seeded pyrenes.—Shrubs either unarmed or with axillary thorns. Stipules interpetiolar, pointed, with a broad base. Flowers in axillary cymes or clusters.

A considerable genus, extending over tropical Africa, Asia, and the Pacific Islands. Of the seven Australian species one extends into the Pacific Islands, the others appear to be endemic.

Stigma ovoid or mitre-shaped, entire or very shortly 2-lobed.

Flowers in pedunculate cymes, the lobes of the corolla longer than the tube.



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|--|-------------------------------|
| Leaves broadly ovate, prominently penniveined and reticulate . . . | 1. <i>C. latifolium</i> . |
| Leaves oblong-elliptical to narrow-lanceolate, prominently and obliquely penniveined | 2. <i>C. attenuatum</i> . |
| Leaves ovate to oblong-elliptical (2 to 6 in. long) very smooth and shining, the veins scarcely prominent | 3. <i>C. lucidum</i> . |
| Leaves oblong, rarely $1\frac{1}{2}$ in. long, scarcely shining, the veins rarely conspicuous. Flowers about 3 lines long | 4. <i>C. oleifolium</i> . |
| Leaves ovate, rarely above 1 in. long, smooth and shining. Flowers not 2 lines long | 5. <i>C. buxifolium</i> . |
| Stigma thick, deeply 2-lobed. Flowers 2 or 3 together. Lobes of the corolla narrow, rather shorter than the tube. Leaves small | 6. <i>C. vacciniifolium</i> . |
| Stigma broad, peltate, entire. Flowers in sessile clusters. Lobes of the corolla much shorter than the tube | 7. <i>C. coprosmoides</i> . |

1. ***C. latifolium*, F. Muell. Herb.** A glabrous and apparently glaucous shrub, nearly allied to *C. lucidum*. Leaves broadly ovate, very rigid, the pinnate veins and reticulations much more prominent than in *C. lucidum*. Flowers much smaller than in that species, and in looser cymes, otherwise their structure as well as the inflorescence the same.

N. S. Wales. In the interior towards the Barrier Range (Nelson?) in Herb. F. Mueller.

S. Australia. N.W. interior, M'Douall Stuart.

2. ***C. attenuatum*, R. Br. ms.** A glabrous shrub, very nearly allied to *C. lucidum*. Leaves narrower, from oblong-elliptical and about 2 in. to narrow-lanceolate and 5 or 6 in. long, the pinnate veins much more oblique and more prominent than in *C. lucidum*. Flowers nearly the same, but in shorter and more dense cymes, and the tube of the corolla longer in proportion to the lobes.

N. Australia. Brunswick Bay, N.W. coast, A. Cunningham; Victoria River and Arnhem's Land, F. Mueller; N. coast, R. Brown; Sweers Island, Henne.

Queensland. Burdekin and Burnett rivers, F. Mueller; Port Denison, W. Hill, Bowman; St. George's Bridge on the Balonne, Mitchell.

3. ***C. lucidum*, Hook. and Arn. Bot. Beech. 65.** A tall shrub or small tree, perfectly glabrous. Leaves ovate, obovate or elliptical-oblong, obtuse or scarcely acuminate, narrowed into a short petiole, scarcely exceeding 2 in. in some specimens, 4 to 6 in. long in others, coriaceous, very smooth and shining, with distant very oblique veins scarcely prominent. Cymes axillary, shortly pedunculate, often large and many-flowered but shorter than the leaves. Pedicels short or sometimes the flowers sessile, except those in the forks. Corolla glabrous outside, slightly hairy inside, the tube about 1 line; lobes about 2 lines long. Anthers exerted. Stigma thick, ovoid, more or less mitre-shaped (hollowed at the base round the style). Fruit, when both carpels ripen, somewhat compressed and didymous, 3 to 4 lines broad, but often one-seeded and nearly globular.—*C. lanprophyllum*, F. Muell. Fragm. ii. 133.

N. Australia. Gulf of Carpentaria, R. Brown.

Queensland. E. coast, R. Brown; Dawson and Barnett rivers, F. Mueller; Port Denison, Fitzalan; Edgecombe Bay, Dullachy; Rockhampton, Thozet; Brisbane river, Moreton Bay, A. Cunningham, F. Mueller, and others.

N. S. Wales. Clarence river, Beckler; Tweed river, C. Moore.

Some of the specimens are precisely the same as those from the Sandwich, the Fiji, and other islands of the N. and S. Pacific, though in some of the latter the pedicels are longer, showing an approach to the inflorescence of the common *C. didymum*, Gaertn. The flowers are, however, in the Australian as well as in the Pacific specimens, almost constantly 4-merous, and usually 5-merous in *C. didymum*.

4. ***C. oleifolium***, Hook. in *Mitch. Trop. Austr.* 397. A tall glabrous shrub, sometimes glaucous, a few branchlets occasionally degenerating into short spines. Leaves oblong, obtuse, narrowed into a short petiole, rarely above $1\frac{1}{2}$ in. long in the flowering specimens, larger in barren ones, thick and smooth but scarcely shining, the veins usually inconspicuous. Flowers in short almost sessile axillary cymes, rather smaller than in *C. lucidum*, and varying in the number of parts 4 or 5. Corolla-tube nearly as long as the lobes, the flowers otherwise the same as in *C. lucidum*. Fruit also the same, didymous when both carpels ripen.

Queensland. Burdekin river, *F. Mueller*; Suttor river, *Sutherland*.

N. S. Wales. Plains of the Gwydir, *Mitchell*; Castlereagh river, *C. Moore*; Darling river to Cooper's Creek, *Nielson*.

5. ***C. buxifolium***, Benth. Glabrous and much-branched. Leaves ovate or broadly elliptical, obtuse or obscurely and obtusely acuminate, narrowed into a short petiole, rarely exceeding 1 in. in length, coriaceous, very smooth and shining, the veins few, very oblique and scarcely conspicuous. Flowers 4-merous, very small, rather numerous, in pedunculate cymes about as long as the leaves, the pedicels short except those in the forks. Corolla not 2 lines long, the tube exceedingly short, glabrous inside, the lobes much longer. Stamens exserted. Stigma mitre-shaped. Fruit of *C. lucidum*, or rather smaller.

Queensland. Burnett and Dawson rivers, *F. Mueller*; also in *Leichhardt's* collection.

The preceding five species are certainly very nearly allied to each other, differing chiefly in foliage and in the size of the flowers and length of corolla-tube, but they can scarcely be united into one species without adding them all to the *C. didymum*, Gaertn.

6. ***C. vacciniifolium***, *F. Muell. in Trans. Phil. Inst. Vict.* iii. 47. A shrub attaining 16 ft. or more, with very numerous slender divaricate branches, the smaller branchlets sometimes spinescent. Leaves petiolate, from broadly obovate to oblong, obtuse, $\frac{3}{4}$ to nearly $\frac{1}{2}$ in. long, the veins scarcely conspicuous. Flowers usually 4-merous, 2 or 3 together in little axillary cymes, the common peduncle and pedicels very short and slender. Corolla about 3 lines long, the lobes narrow, acute, rather shorter than the tube. Stamens exserted. Stigma ovoid, divided to the base into 2 thick lobes. Fruit, when ripening both carpels, a little more than 2 lines diameter, the pyrenes not so hard as in *C. lucidum*, and especially as in *C. coprosmoides*. — *C. microphyllum*, *F. Muell. Fragm.* ii. 134.

Queensland. Cairncross island and Suttor river, *F. Mueller*; Mount Wyatt, *Bowman*; Kent's Lagoon, *Leichhardt*; Brisbane river, Moreton Bay, *F. Mueller*, *C. Stuart*.

N. S. Wales. Macleay river, *Beckler*.

7. ***C. coprosmoides***, *F. Muell. in Trans. Phil. Inst. Vict.* iii. 47. A tall shrub or small tree, quite glabrous. Leaves obovate ovate or broadly elliptical, obtuse, shortly contracted at the base, in some specimens all under 2 in., in others 3 to 4 in. long, coriaceous but scarcely shining, the veins



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Hamamelis virginica L. f. *Hamamelis*
 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 846. 847. 848. 849. 850. 851. 852. 853. 854. 855. 856. 857. 858. 859. 860. 861. 862. 863. 864. 865. 866. 867. 868. 869. 870. 871. 872. 873. 874. 875. 876. 877. 878. 879. 880. 881. 882. 883. 884. 885. 886. 887. 888. 889. 890. 891. 892. 893. 894. 895. 896. 897. 898. 899. 900. 901. 902. 903. 904. 905. 906. 907. 908. 909. 910. 911. 912. 913. 914. 915. 916. 917. 918. 919. 920. 921. 922. 923. 924. 925. 926. 927. 928. 929. 930. 931. 932. 933. 934. 935. 936. 937. 938. 939. 940. 941. 942. 943. 944. 945. 946. 947. 948. 949. 950. 951. 952. 953. 954. 955. 956. 957. 958. 959. 960. 961. 962. 963. 964. 965. 966. 967. 968. 969. 970. 971. 972. 973. 974. 975. 976. 977. 978. 979. 980. 981. 982. 983. 984. 985. 986. 987. 988. 989. 990. 991. 992. 993. 994. 995. 996. 997. 998. 999. 1000.

distant and not prominent. Flowers 4-merous or 5-merous, very shortly pedicellate, in sessile axillary clusters of 3 to 6. Corolla-tube slender, fully 4 lines long, bearded inside at the orifice, the lobes about $\frac{1}{2}$ as long as the tube. Anthers slightly protruding. Style exserted, with a broad thick petalate stigma. Fruit sometimes $\frac{1}{2}$ in. broad, on a pedicel of 2 to 4 lines.

Queensland. Port Denison, *Fitzalan*; Edgecombe and Rockingham Bays, *Dallachy*, *W. Hill*; Rockhampton, *Thozet*; Dawson and Brisbane rivers, *F. Mueller*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; Hastings and Clarence rivers, *Beckler*.

The species is very closely allied to *C. barbatum*, Benth., from the Pacific Islands, but the leaves are more coriaceous and obtuse, the pedicels shorter, and the corolla-lobes more obtuse.

SUBTRIBE IV. PSYCHOTRIÆ.—Corolla-lobes valvate. Ovules erect from the base or laterally attached below the middle. Style-lobes short. Fruit a berry-like drupe with 1-seeded pyrenes. Albumen copious.—Trees or shrubs.

17. MORINDA, Linn.

Flowers usually several together, united at the base into a small head. Calyx-limb short, scarcely toothed. Corolla-tube cylindrical or slightly dilated at the top; lobes 5, rarely 4, valvate in the bud. Anthers included in the tube or rarely exserted. Ovary 2-celled or more or less completely 4-celled, with 1 ovule in each cell, laterally attached at the base or below the middle; style exserted, with 2 stigmatic lobes or rarely entire. Fruits of each flower-head united in a compound succulent berry, including a number of hard 1-seeded pyrenes, usually 2 to 4, proceeding from each flower.—Shrubs or small trees, or sometimes woody climbers. Stipules usually membranous and united within the petioles in a short sheath. Flower-heads on axillary or terminal solitary or clustered peduncles.

A considerable tropical genus, chiefly Asiatic or African, with 2 or 3 American species. Of the 4 Australian species, one is common in tropical Asia, another as widely distributed over the seacoasts of southern Asia and the Pacific, the two others are endemic.

Peduncles solitary, apparently leaf-opposed. Leaves very large . . . 1. *M. citrifolia*.

Peduncles 2 together at the ends of the branches 2. *M. jasminoides*.

Peduncles 4 or more together at the ends of the branches.

Leaves ovate to oblong-lanceolate, not much veined. Flower-heads without prominent bracts 3. *M. umbellata*.

Leaves broadly ovate or orbicular, coriaceous and prominently reticulate. One large coloured leafy bract to each flower-head . . . 4. *M. reticulata*.

1. *M. citrifolia*, Linn.; DC. *Prod.* iv. 446. A tall glabrous shrub, with thick more or less 4-angled branches. Leaves large, ovate, broad or narrow, mostly 6 to 10 in. long, on very short petioles. Stipules large, membranous. Flower-heads on very short peduncles, apparently leaf-opposed from the abortion of the subtending leaf, without prominent bracts. Flowers numerous, the calyx-tubes quite connate. Corolla-tube $\frac{1}{4}$ to $\frac{1}{2}$ in. long; lobes shorter than the tube. Ovary 2-celled, the ovules ascending, attached below or near the middle. Fruit forming a pulpy mass above 1 in. diameter, the pyrenes orbicular, flattened, about 3 lines diameter.

Queensland. Along the coast and adjoining islands, from Albany island and Cape York to Percy islands and Edgecombe Bay, *A. Cunningham*, *F. Mueller*, and others. Com-

mon on the seacoasts of tropical Asia and especially of the Pacific islands. The Australian specimens are in leaf, in fruit, or in very young bud, and the flowers are described from Asiatic specimens. The fruits received from F. Mueller, as those of the "Leichhardt Tree," or *Sarcocephalus Leichhardtii*, Rep. Burdek. Exped. 12, belong to *Morinda citrifolia*.

2. *M. jasminoides*, *A. Cunn.*; *Hook. Bot. Mag. t.* 3351. A tall glabrous shrub, attaining sometimes 20 ft., with weak straggling branches. Leaves from nearly ovate to oblong-lanceolate, acuminate, narrowed into the petiole, $1\frac{1}{2}$ to 3 in. long. Stipules connate, deciduous. Peduncles slender, 2 together at the ends of the branches, each with a small head of 6 to 12 or even more flowers, the calyx-tubes quite connate or immersed in the receptacle. Corolla 3 to 4 lines long, the tube straight, usually shorter than the lobes. Ovary 4-celled; style 2-lobed. Drupes conerete, forming a globular compound berry about $\frac{1}{2}$ in. diameter.

Queensland. Brisbane river, Moreton Bay, *F. Mueller*; *C. Stuart*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolfs*, and others; northward to Hastings and Clarence rivers, *Beckler*; southward to Mlawarra, *Shepherd*.

Victoria. Snowy and Broadribb rivers, *F. Mueller*.

The species is very nearly allied to *M. umbellata*, differing chiefly, but apparently constantly, in the peduncles, never more than 2 together and the flowers large.

3. *M. umbellata*, *Linn.*; *W. and Arn. Prod. i.* 420. A trailing diffuse or somewhat climbing shrub, glabrous or the young branches slightly pubescent. Leaves from ovate-oblong or obovate to oblong-lanceolate, $1\frac{1}{2}$ to 3 in. long. Peduncles $\frac{1}{4}$ to $\frac{1}{2}$ in. long, 4 to 8 together (usually about 6) at the ends of the branches, each with a small head of about 6 to 12 flowers, the calyx-tubes quite connate or immersed in the receptacle. Corolla scarcely 3 lines long, the tube straight, rather shorter than the lobes. Ovary 4-celled; style 2-lobed. Drupes forming a compound globular berry, 4 to 6 lines in diameter.

Queensland. Rockingham Bay, *Dallachy*. The species has a wide range over E. India and the Archipelago.

4. *M. reticulata*, *Benth.* A low struggling shrub, quite glabrous. Leaves petiolate, orbicular or broadly ovate, very shortly and acutely acuminate, about 2 to 3 in. long, coriaceous and prominently reticulate, like those of *Celospermum reticulatum*. Stipules triangular, acute. Peduncles 4 together at the ends of the branches, bearing each a head of about 6 to 12 flowers, one large orbicular petiolate coloured bract to each head, adnate to one of the calyxes, like those of *Mussaenda*. Calyx-tubes partly immersed in the receptacle. Corolla-tube slender, about 6 lines long; lobes about 2 lines long. Anthers exserted. Ovary (if rightly observed) 2-celled, with 2 collateral ovules in each cell, attached about the middle. Style long, with two short stigmatic lobes.

Queensland. Albany island, *W. Hill*; N.E. coast, *A. Cunningham*.

In the only two flowers I detached from a head to examine, I did not feel quite certain whether there were 2 or 4 ovules to each flower.

18. *COELOSPERMUM*, Blume.

(*Pogonolobus*, *F. Muell.*)

Calyx-limb truncate or obscurely toothed. Corolla-tube cylindrical or

slightly dilated at the top; lobes 4 or 5, valvate in the bud. Anthers exerted, linear. Ovary 2-celled, with 2 ovules in each cell, laterally almost peltately attached on each side of a very prominent placenta; style 2-lobed. Fruit a drupe, with 4 distinct hard 1-seeded pyrenes.—Shrubs with straggling or climbing branches. Stipules interpetiolar, acuminate, separate or shortly connate within the petioles. Flowers in umbels clusters or cymes, terminal and solitary or forming terminal thyrsoid panicles.

The genus, if rightly identified, extends over the Indian Archipelago, the two Australian species, however, being endemic. Although I have not seen the two species described by Blume and Korthals (but unknown to Miquel), I have little doubt of their being congeners. The chief character consists in the ovules and 1-seeded pyrenes being twice the number of the carpels and style-lobes, as in several species of *Morinda*, from which *Cælospermum* differs in its separate flowers.

Leaves smooth and shining, the veins not very prominent. Cymes

rather dense, in oblong panicles. 1. *C. paniculatum*.

Leaves rigid, prominently veined and reticulate. Umbels solitary. 2. *C. reticulatum*.

1. **C. paniculatum**, *F. Muell. Fragm.* v. 19. A woody climber, quite glabrous. Leaves petiolate, ovate, ovate-lanceolate, or oblong, shortly acuminate, coriaceous, shining, 2 to 1 in. long, the veins not very prominent. Stipules (or their remains?) forming a short ring. Flowers white, in cymes forming a dense oblong terminal panicle. Corolla-tube nearly 2 lines long; lobes 5, rather longer than the tube. Style deeply divided into 2 linear lobes. Fruit globular, with 4 one-seeded pyrenes.

Queensland. Rockingham Bay, *Dallachy*; Pine river, *Fitzalan*.

N. S. Wales. Clarence river, *Beckler*.

2. **C. reticulatum**, *Benth.* A scrubby shrub (*Dallachy*), the branches often flexuose and perhaps sometimes climbing, usually glabrous. Leaves obovate or oval-oblong, very shortly and acutely acuminate, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, rigid, the pinnate veins and reticulate veinlets very prominent. Stipules acuminate, not connate. Flowers pedicellate, in umbels or clusters either terminal and sessile, or axillary by the reduction of the flowering branches to leafless peduncles. Corolla-tube nearly 3 lines long; lobes 4 or 5, shorter than the tube, villous inside. Style with 2 linear stigmatic lobes. Fruit globular, about 4 lines diameter, containing 4 bony pyrenes.—*Pogonolobus reticulatus*, *F. Muell. Fragm.* i. 56, and *Rep. Burdek. Exped.* 11.

N. Australia. Arnheim S. Bay, *R. Brown*; Low Island, *Henne*; M'Adam and Newcastle ranges, *F. Mueller*.

Queensland. Bay of Inlets, *Banks and Solander*; Dayman's Island, *W. Hill*; Port Molle and Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Rockhampton, *Thozet*; Belyando river, *Mitchell*.

19. LASIANTHUS, Jack.

(Mephitidia, *Reinw.*)

Calyx-limb obscurely toothed or lobed. Corolla-tube usually dilated at the top, lobes 4 to 6, valvate in the bud. Anthers included in the tube or shortly exerted. Ovary 4- to 9-celled, with 1 erect ovule in each cell; style divided at the top into as many linear stigmatic lobes as ovary-cells. Fruit a drupe crowned by the calyx-limb, with as many 1-seeded pyrenes as ovary-cells, or fewer by abortion.—Shrubs or undershrubs, often smelling disagree-

ably, the specimens usually drying black. Stipules interpetiolar, pointed, with a broad base. Flowers small, in dense clusters or heads, axillary or, in some species not Australian, terminal.

The genus extends over tropical Asia, but is chiefly abundant in the Archipelago. The only Australian species appears to be the same as one extending from Ceylon over a part at least of the Archipelago.

1. **L. strigosus**, *Wight in Calc. Journ. Nat. Hist.* vi. 512. An erect shrub, the branches and under side of the leaves more or less hirsute with short rigid hairs. Leaves very shortly petiolate, mostly oblong in the Australian specimens, broader in some others, 3 to 5 in. long, with about 6 or 7 very oblique veins prominent underneath on each side of the midrib, and transverse veinlets. Flowers sessile and clustered, about 3 in each axil. Bracts small. Calyx about $1\frac{1}{2}$ lines long, the limb obscurely toothed, longer than the adnate tube. Corolla rather more than 2 lines long; lobes 4 or 5, scarcely so long as the tube. Stamens not exerted. Ovary usually 4-celled, with a very thick fleshy concave epigynous disk. Fruit ovoid-globular, about $\frac{1}{4}$ in. diameter.—*Mephitidia strigosa*, Thw. Enum. Ceyl. Pl. 146.

Queensland. Rockingham Bay, *Dallachy*. These specimens quite agree with Cingalese ones. Blume's character of *L. sylvestris*, Bl. Bijdr. 999, agrees also well with our plant, but not the specimens so named by Miquel. *L. chinensis*, Benth. Fl. Hongk. 160, may also possibly prove to be the same, but, as observed by Thwaites, the whole genus requires much further investigation before the extent of variation to which the species are liable can be satisfactorily ascertained.

20. PSYCHOTRIA, Linn.

(*Grumilia*, Gærtn.)

Calyx-limb short, truncate, toothed or lobed. Corolla-tube short; lobes 5, or rarely 4, valvate in the bud. Anthers included in the tube or shortly exerted. Ovary 2-celled, with 1 ovule in each cell, erect from the base. Style short, with 2 stigmatic lobes. Fruit a drupe, with 2 hemispherical pyrenes, smooth or with longitudinal ribs and furrows. Seed hemispherical, with furrows corresponding to those of the endocarp, or ruminate, or smooth.—Shrubs or small trees. Stipules interpetiolar, 1 on each side, membranous, and often connate within the petioles, and very deciduous in the Australian species, small, persistent and 1 or 2 on each side in many American ones. Flowers usually small, in terminal cymes, or, in species not Australian, axillary.

A large genus, ranging over the tropical regions both of the New and the Old World. The Australian species appear to be all endemic. The limits of the genus are not well defined. The above character includes *Grumilia*, usually but vaguely distinguished by the seed, and excludes *Chasalia*, *Patipourea*, and others scarcely differing but by the length of the corolla-tube, characters requiring confirmation by the study of very numerous little known or undescribed species.

SECTION I. **Grumilia**.—*Calyx-limb (at least in the Australian species) obscurely sinuate-toothed. Pyrenes not furrowed. Seeds ruminate.*

Leaves obtuse. Cymes divaricate. Corolla 2 to 3 lines long . . . 1. *P. nesophila*.

Leaves acuminate. Cymes paniculate. Corolla 1 line long . . . 2. *P. Dallachiana*.

SECTION II. **Mapourea**.—*Calyx-limb (at least in the Australian species) distinctly*



Myrsine rubra (L.) Gaertn.
1822. *Myrsine rubra* (L.) Gaertn.
4

toothed. Pyrenes and seeds longitudinally furrowed. Stipules membranous, 1 on each side, deciduous.

- Flowers capitate on the branches of the cyme. Leaves usually softly pubescent or tomentose 3. *P. loniceroides*.
 Flowers in corymbs, cymose to the last. Leaves usually glabrous.
 Corolla about 2 lines long; lobes as long as the cylindrical tube.
 Corolla glabrous outside. Fruit ovoid 4. *P. daphnoides*.
 Corolla hoary-tomentose. Fruit globular 5. *P. polioctemma*.
 Corolla about 3 lines long, lobes shorter than the ovoid tube. Leaves thick and coriaceous 6. *P. Fitzalanii*.

There are also specimens from Rockingham Bay, *Dallachy*, of what appear to be two other species of the section *Grumilia*, and from Cape York, *McGillivray*, of another of the section *Mapourea*, but all insufficient for definition.

SECTION I. GRUMILIA.—Calyx-limb (at least in the Australian species) obscurely sinuate-toothed. Pyrenes not furrowed. Seeds ruminant. Stipules 1 on each side, very deciduous.

1. ***P. nesophila***, *F. Muell. Fragm.* ii. 135. A shrub or tree, quite glabrous. Leaves broadly ovate obovate or almost oblong, obtuse or very shortly and obtusely acuminate, 1 to 3 in. long, narrowed into a rather long petiole, thinly coriaceous. Flowers in shortly pedunculate very divaricate terminal cymes. Calyx-limb truncate or obscurely toothed. Corolla glabrous outside, very hairy inside; tube $1\frac{1}{2}$ lines long; lobes as long as the tube, thickened and hood-shaped at the tips. Ovules broad. Fruit globular, smooth, the pyrenes very obscurely ribbed. Seeds hemispherical, very much ruminant-rugose.

N. Australia. N. coast, *R. Brown*; N. Goulburn island, *A. Cunningham*; Port Essington, *Armstrong*.

Queensland. Albany island, *F. Mueller*.

2. ***P. Dallachiana***, *Benth.* A straggling shrub of 6 to 8 ft., quite glabrous. Leaves elliptical or oblong, acuminate, narrowed into a rather long petiole, mostly 3 to 4 in. long, smooth and almost shining. Flowers very small, in an ovate very shortly pedunculate panicle, dense when first coming out. Calyx-limb slightly sinuate-toothed. Corolla glabrous outside, bearded inside at the throat, about 1 line long but perhaps not yet at its full size; anthers exerted. Ovules ovoid. Fruiting panicle loose, divaricately trichotomous. Fruits globular, about 3 lines diameter, the pyrenes not ribbed. Seeds ruminant.

Queensland. Rockingham Bay, *Dallachy*. I do not feel quite sure that the specimens coming into flower are rightly identified with the fruiting ones, but believe them to belong to the same species.

SECTION II. MAPOUREA.—Calyx-limb (at least in the Australian species) distinctly toothed. Pyrenes and seeds longitudinally furrowed. Stipules 1 on each side, membranous, deciduous.

The American *Mapoureas* are distinguished from *Psychotria* proper, chiefly by the stipules. It remains yet to be ascertained whether the Asiatic and Australian species strictly belong in other respects to the same section.

3. ***P. loniceroides***, *Sieb. in DC. Prod.* iv. 523. A shrub attaining 12 to 15 ft., the branches, foliage, and inflorescence more or less rusty-

tomentose or softly pubescent, or rarely the leaves at length glabrous above. Leaves ovate elliptical or oblong, acuminate or almost obtuse, narrowed into a petiole, mostly 2 to 3 in. long. Peduncles terminal but often appearing lateral from the elongation of only one branch of the fork, shorter than the leaves, more or less cymosely branched or almost umbellate, each branch bearing a small dense cyme or head of small sessile flowers. Bracts not exceeding the flowers. Calyx hirsute, the lobes or teeth acute, longer than the tube. Corolla-tube broad, about 2 lines long, lobes shorter than the tube, hirsute outside; anthers exerted. Fruits ovoid, pubescent, crowned by the calyx-limb; pyrenes and seeds longitudinally ribbed and furrowed.

Queensland. Wide Bay, *Bidwill*; Brisbane river, Moreton Bay, *A. Cunninghamham*, *F. Mueller*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Scher*, n. 263, and others; Port Macquarrie, *Backhouse*, *M. Arthur*.

Var. *angustifolia*. Leaves narrow, on very short petioles, softly villous. Cymes with very few flower-heads. Rockingham Bay, *Dallachy*.

4. ***P. daphnoides***, *A. Cunn.*; *Hook. Bot. Mag. t.* 3228. Shrubby, glabrous, except the inflorescence. Leaves obovate or oblong, very obtuse or rarely shortly acuminate, in some specimens under 1 in., in others 2 in. long or more, narrowed into a petiole, somewhat coriaceous, almost veinless except the midrib. Cymes terminal, pedunculate, trichotomous or the primary branches almost umbellate, 1 to nearly 2 in. diameter, rather dense, the flowers all sessile but not capitate, the branches and calyxes hoary-tomentose or glabrous. Calyx-limb 5-toothed. Corolla about 2 lines long, glabrous outside, bearded inside at the throat, the lobes as long as the tube. Fruit ovoid, the pyrenes and seeds prominently ribbed and furrowed.

Queensland. Cape York, *M. Gillivray*; N.E. coast, *A. Cunninghamham*; Barnett river, *F. Mueller*; Port Denison, *Fitzalan*; Wide Bay, *Bidwill*; Fitzroy river, *Bowman*; Rockhampton, *Thozet*, *Dallachy*; Brisbane river, Moreton Bay, *A. Cunninghamham*, *F. Mueller*.

N. S. Wales. Clarence river, *Beckler*.

The tropical specimens have mostly large leaves; the small-leaved specimens (mostly under 1 in.) are chiefly subtropical.

Var. *angustifolia*. Leaves narrow-oblong. Queensland, *Bowman*.

5. ***P. polioctemma***, *Benth.* Nearly allied to the larger forms of *P. daphnoides*, but the leaves are larger, mostly 3 to 4 in. long, the flowers numerous, in more pedunculate cymes, the corollas hoary-tomentose outside, and the fruit globular, not ovoid.

Queensland. Cape York, *M. Gillivray*, Edgecombe Bay, *Dallachy*; Mount Elliott, *Fitzalan*. *A. Gray*, from a memorandum in Herb. Hook., thinks this may be a variety of his *P. leptocaulis*, from the Fiji islands. We have no specimens to compare, but he describes the leaves as acuminate, the pedicels slender, and the calyx truncate, none of which points agree with our plant, and which seem to indicate rather a species of the section *Grunilia*.

6. ***P. Fitzalanii***, *Benth.* Quite glabrous. Leaves broadly ovate or obovate, obtuse, narrowed into a petiole, 2 to 3 in. long, very thick and coriaceous. Cymes pedunculate, terminal, corymbose, shorter than the leaves, glabrous. Calyx-limb short, distinctly toothed. Corolla nearly 3 lines long, the tube almost ovoid, hairy inside; lobes 5, shorter than the tube. An-



thers exserted. Style with 2 short oblong stigmatic lobes. Ovules of *Psychotria*. Fruit not seen.

Queensland. Port Molle, *Fitzalan* (Burdekin Expedition).

SUBTRIBE V. ANTHOSPERMEÆ.—Corolla-lobes valvate. Ovules erect from the base. Style-lobes very long and subulate. Fruit a berry-like drupe. Albumen copious.—Shrubs, rarely trees or herbs. Flowers often unisexual or polygamous.

21. COPROSMA, Forst.

(*Marquisia*, *A. Rich.*)

Calyx-limb toothed or lobed. Corolla-tube short; lobes 4, 5 or rarely 6, valvate in the bud. Stamens inserted at the base of the tube; filaments long; anthers exserted. Ovary 2-celled, with one erect ovule in each cell; style divided nearly to the base into 2 long filiform lobes, more or less papillose-hirsute. Fruit a berry-like drupe, with 2 1-seeded pyrenes, usually furrowed on the inner face. Shrubs, erect and bushy or prostrate and creeping. Leaves usually small. Stipules interpetiolar, acuminate or acute, sometimes denticulate. Flowers solitary or clustered, axillary or terminal, usually dioecious, the males with an imperfect or absolutely abortive style and no ovary, the females with small stamens, more or less imperfect. The whole plant often fetid when fresh.

The genus is most numerous in New Zealand, but extends also to the Pacific islands and to Borneo. Of the five Australian species, one is also in New Zealand, the others are endemic.

Flowers clustered, 2 or 3 together. Leaves mostly above 1 in. long.

Leaves acutely acuminate, much and conspicuously veined 1. *C. acutifolia*.

Leaves very shortly acuminate; veins few and distant 2. *C. hirtella*.

Flowers solitary. Leaves small.

Erect bushy shrubs. Corolla-lobes much longer than the tube.

Leaves thin, flat 3. *C. Billardieri*.

Leaves coriaceous, shining, with recurved margins 4. *C. nitida*.

Prostrate creeping shrub. Corolla-lobes shorter than the tube . . . 5. *C. pumila*.

1. **C. (?) acutifolia**, *F. Muell. Herb.* Quite glabrous. Leaves ovate, acutely acuminate, narrowed into a very short petiole, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, very coriaceous and shining, but the numerous veins and reticulations very conspicuous on both sides. Flowers small, sessile, in pairs or threes, on very short peduncles, clustered in the axils, all males in the specimens seen. Corolla about $1\frac{1}{2}$ lines long; lobes valvate, longer than the tube. Anthers exserted. Ovary rudimentary, without any cavity or style.

N. S. Wales. Durandoo, in the western interior, *Goodwin and Dallachy*.

2. **C. hirtella**, *Labill. Pl. Nov. Holl.* i. 70. t. 95. A rigid shrub, of 3 to 5 ft., quite glabrous or minutely scabrous-pubescent. Leaves from broadly ovate to elliptical or lanceolate, shortly and acutely acuminate, narrowed into a short petiole, the larger ones 2 to 3 in. long, thick and coriaceous, with few scarcely prominent veins, usually scabrous on the upper side. Flowers few together, in very shortly pedunculate terminal heads, becoming axillary by the growth of the shoot, with a pair of lanceolate acuminate con-

nate bracts or floral leaves under the head. Calyx minutely toothed. Corolla nearly 3 lines long in the males, the lobes 4 to 6, longer than the tube, rather smaller in the females. Style-branches fully $\frac{1}{2}$ in. long, very shortly united at the base.—DC. Prod. iv. 578; Hook. f. Fl. Tasm. i. 165; *C. cuspidifolia*, DC. l. c.

N. S. Wales. Damp situations in the western ranges of the Blue Mountains, and near Bathurst, *A. and R. Cunningham*; Argyle County, *M'Arthur*.

Victoria. Rich wet valleys of the Buffalo Range, *F. Mueller*; Portland Ranges, *Robertson*; Port Phillip, *R. Brown*.

Tasmania. Port Dalrymple, *R. Brown*; abundant in rocky places throughout the colony, *J. D. Hooker*.

3. **C. Billardieri**, *Hook. f. in Hook. Lond. Journ.* vi. 465, and *Fl. Tasm.* i. 165. A slender twiggy shrub, of 6 to 12 ft., glabrous or minutely pubescent, the smaller branchlets often spinescent. Leaves elliptical-oblong or lanceolate, obtuse or acute, all under $\frac{1}{2}$ in. long, of a thin texture, glabrous. Flowers solitary, terminating very short axillary shoots, with a pair of bracts under the calyx. Calyx-limb very short, acutely 4-lobed. Corolla about 2 lines long, the tube very short, smaller and narrower in the females than in the males. Style-branches 4 or 5 lines long. Fruits small, red.—*Canthium quadrifidum*, Labill. Pl. Nov. Holl. i. 69. t. 94; *Marquisia Billardieri*, A. Rich. in Mém. Soc. Hist. Nat. Par. v. 192; DC. Prod. iv. 477.

N. S. Wales. Arne river, *Beckler*; Mount Tomah, *Woolfs*; Five Islands, *A. Cunningham*; Twofold Bay, *F. Mueller*.

Victoria. Yarra river, Dandenong Ranges, *F. Mueller*; Corner Inlet, *Withdon*.

Tasmania. Common by the banks of streams in rich soils, in shaded ravines and dense forests, "Native Currant," *J. D. Hooker*.

4. **C. nitida**, *Hook. f. in Hook. Lond. Journ.* vi. 465, and *Fl. Tasm.* i. 165. t. 39 A. A rigid bushy shrub, of 5 to 6 ft., quite glabrous, the branchlets rarely spinescent. Leaves elliptical lanceolate or oblong, obtuse or acute, all under $\frac{1}{2}$ in. long, or in luxuriant specimens $\frac{1}{2}$ to 1 in., coriaceous and shining, with recurved margins. Flowers of *C. Billardieri*, solitary and terminating very short axillary shoots. Fruit ovoid oblong or nearly globular, larger than in *C. Billardieri*.

Victoria. Mount Baw-Baw, at an elevation of 4 to 5000 ft., *F. Mueller*.

Tasmania, *R. Brown*; common on open mountain-tops, *J. D. Hooker*.

5. **C. pumila**, *Hook. f. in Hook. Lond. Journ.* vi. 465, and *Fl. Tasm.* i. 166. A prostrate densely-matted glabrous shrub, creeping and rooting sometimes to a great extent. Leaves ovate, obtuse, 2 to 3 lines long, coriaceous, shining. Flowers solitary, terminal, sessile between the last leaves. Calyx-lobes ovate, obtuse. Corolla about $2\frac{1}{2}$ lines long, the tube dilated upwards, almost campanulate; lobes much shorter than the tube in the males, rather deeper in the females. Stamens much exerted. Styles not so long as in the other species.

Victoria. Snowy mossy plains, Baw-Baw, Cobberas mountains, and others of the Australian Alps, at an elevation of 4 to 6000 ft., *F. Mueller*.

Tasmania. Middlesex plains and all the mountain-tops, abundant, *J. D. Hooker*. The species is also in New Zealand.

22. *NERTERA*, Banks.

(Cunina, Clos.)

Calyx-limb inconspicuous or 2-lobed. Corolla-tube campanulate or slender; lobes 4, valvate in the bud. Stamens inserted at or near the base of the corolla-tube; filaments long; anthers exerted. Ovary 2-celled, with 1 erect ovule in each cell; style divided nearly to the base into 2 long filiform lobes, more or less papillose-hirsute. Fruit a berry-like drupe, with 2 1-seeded pyrenes.—Slender prostrate or creeping perennials. Stipules interpetiolar, very small. Flowers solitary, terminal, sessile or very shortly pedicellate within the last leaves, hermaphrodite or polygamo-dioecious.

A small genus, extending over New Zealand, Antarctic and Andine America, the Indian Archipelago, and the Pacific islands. Of the two Australian species, one is the common one over nearly the whole range of the genus, the other is endemic.

Glabrous. Calyx-limb obsolete. Corolla campanulate 1. *N. depressa*.
Hirsute. Calyx 2-lobed. Corolla slender 2. *N. reptans*.

1. *N. depressa*, Banks; DC. *Prod.* iv. 451. A slender prostrate perennial, creeping and rooting at the nodes, quite glabrous, forming sometimes dense patches of very few inches in diameter, sometimes extending to a considerable length, usually drying black. Leaves petiolate, from ovate to orbicular, obtuse or acute, rounded or almost cordate at the base, often all under 2 lines long, but in luxuriant specimens 3 or even 4 lines. Flowers solitary, terminal, but the fruits sometimes appearing axillary after the shoot has grown out. Calyx-limb none or scarcely conspicuous. Corolla glabrous, campanulate, scarcely above 1 line long, the lobes shorter than the tube. Drupe ovoid or globular, the pyrenes quite smooth.—Sm. Ic. Ined. t. 28; Hook. f. Fl. Tasm. i. 167; *Cunina Sanfuentes*, Clos in C. Gay, Fl. Chil. iii. 203. t. 34.

Victoria. Wet gravelly places, Snowy River, summits of Baw-Baw mountains, sources of the Yarra, *F. Mueller*.

Tasmania. By springs on the summits of the western mountains, *Gunn*.

The species extends to New Zealand, Andine and Antarctic America and the Pacific islands, but the Javanese plant referred to it appears to be distinct. In the small Australian form of *N. depressa*, so far as can be judged from dried specimens, the exocarp encloses but little pulp and dries close upon the nucleus; in the more luxuriant New Zealand and American specimens, it is much larger and more pulpy, and, when dried under pressure, assumes the false appearance of a broad membrane bordering the nucleus, which gave rise to Clos's genus *Cunina*.

2. *N. reptans*, *F. Muell. Herb.* A prostrate creeping perennial, like *N. depressa*, but not usually drying black, and more or less hirsute, with short scattered rather rigid hairs. Leaves very shortly petiolate, ovate, obtuse or acute, 3 to 4 lines long. Flowers terminal, very shortly pedicellate within the last pair of leaves. Calyx-limb of 2 triangular ciliate lobes. Corolla-tube very slender, 4 lines long; lobes short, ciliate, with a few long bristles. Drupe ovoid, not quite 2 lines long when dry, crowned by the calyx-lobes.—*Diodia reptans*, *F. Muell.* in Trans. Vict. Inst. 1855, 128.

Victoria. Mountain pastures and plains along the Snowy River, *F. Mueller*.

SUBTRIBE VI. OPERCULARIÆ.—Corolla-lobes valvate. Ovules erect from the base, usually one only to each flower. Style-lobes long and subulate.

Fruit capsular, 2-valved. Albumen copious.—Herbs undershrubs or rarely small shrubs. Flowers in dense heads, the calyxes connate or in one species free.

23. OPERCULARIA, Gærtn.

Flowers connate by the calyx-tubes in a globular compound or rarely simple and solitary head. Calyx-lobes 3 to 5. Corolla-tube short; lobes 3 to 5, valvate. Stamens inserted at the base of the corolla-tube; filaments long; anthers exserted. Ovary 1-celled, with 1 erect ovule (rarely 2-celled with 1 ovule in each cell, but 1 cell and ovule abortive?); style filiform, divided to the middle or nearly to the base into 2 long usually papillose-hirsute branches, one sometimes abortive. Fruit a 2-valved capsule, the capsules of each compound head distributed into partial heads of 3 to 6, the outer valves in each partial or solitary head united in a persistent cup, the inner valves united in a deciduous operculum. Seeds obovate or oblong, often rugose, the inner face often concave or marked with longitudinal raised ridges. Albumen copious.—Herbs undershrubs or rarely twiners, often very fetid when fresh. Stipules usually forming with the base of the petioles a short sheath, with 1 or 2 entire or ciliate-toothed points on each side. Flower-heads usually in the forks of the stem or terminal, either upon an erect peduncle often longer than the head, or upon a short recurved peduncle, and then often appearing axillary from the development of only one branch of the fork. Flowers often polygamo-dioecious.

The genus is confined to Australia. The species are very difficult to describe with contrasted characters, differing chiefly in the very variable points of foliage and inflorescence. The seeds, as far as known, appear to present more decided specific differences, but it is only in a small portion of the specimens that I have been able to observe them, and their constancy in the same species remains to be proved.

Peduncles erect, terminal or in the forks. Leaves linear. Seed ovoid-oblong, obtusely 3- or 4-angled. Western species, except *O. scabrida*.

Glabrous or nearly so. Leaves acute.

Herb or undershrub. Upper leaves long. Peduncles usually long. Seeds half enclosed on each side in a concave valve-like appendage

1. *O. vaginata*.

Small shrub. Leaves short, clustered in the axils. Peduncles short. Seeds without appendage

2. *O. spermacocca*.

Herb or undershrub. Leaves short or long. Peduncles usually long. Seeds without appendage

3. *O. scabrida*.

Hirsute, with long soft hairs. Leaves obtuse

4. *O. hirsuta*.

Peduncles recurved, all very short, or those of the primary forks only elongated.

Eastern species.

Usually large, glabrous or scabrous-pubescent. Leaves ovate or lanceolate, often above 1 in. long. Heads many-flowered. Seeds with 2 smooth ribs on the inner face

5. *O. aspera*.

Hirsute. Leaves usually under 1 in. Seeds very rugose, the inner face with a prominent centre, without smooth ribs

6. *O. hispida*.

Glabrous. Leaves linear-lanceolate. Flower-heads small, sessile or nearly so. Seeds of *O. hispida*

7. *O. diphylla*.

Small procumbent plant, usually glabrous. Leaves ovate. Seeds very broad, smooth, with 3 prominent ribs on the inner face

8. *O. ovata*.





Glabrous or nearly so, small and diffuse or wiry and elongated.

Leaves and flower-heads small. Seeds broad, slightly rugose, with 2 prominent ribs on the inner face 9. *O. varia*.

Western species.

Stout, erect, glabrous or scabrous. Leaves sessile, ovate-lanceolate or lanceolate. Heads many-flowered 10. *O. rubioides*.

Large, twining, glabrous. Leaves lanceolate, long-acuminate. Heads many-flowered 11. *O. volubilis*.

Large, hirsute, often flexuous. Leaves ovate or lanceolate. Heads many-flowered 12. *O. hispidula*.

Erect, much branched, very hispid, not turning black. Leaves ovate or lanceolate. Flower-heads echinate 13. *O. echinocephala*.

Glabrous. Stems wiry or flexuose. Leaves few, narrow or small. Heads simple, 2- to 5-flowered 14. *O. apiciflora*.

1. *O. vaginata*, *Labill. Pl. Nov. Holl.* i. 34. t. 46. A perennial or undershrub, with erect virgate stems, 6 in. to 1 ft. high or rather more, usually glabrous. Leaves linear or linear-lanceolate, the upper ones often 1 to 2 in. long, the lower ones sometimes very small or abortive. Stipular sheaths long. Heads globular, compound, on rather long erect peduncles, with or without 2 to 4 linear bracts close under the head. Calyx-lobes subulate-acuminate. Corolla rarely exceeding them. Sals small, obovoid-triangular, each with 2 concave appendages one on each side, as long as the seed, fixed at the upper end and falling with the seed, but readily detached.—DC. Prod. iv. 615; Bartl. in Pl. Preiss. i. 369.

W. Australia. From King George's Sound, *R. Brown, Manis, Labillardière*, to Swan River, *Dreadnought, 1st Coll.*: *Preiss.* n. 2429, 2433. Flinders Bay, *Cutler*.

In some old specimens some branches are flexuose and almost leafless like those of *O. apiciflora*, but more rigid, and the fruiting-heads are compound.

O. nulloensis, Bartl. in Pl. Preiss. i. 369, from Princess Royal Harbour, *Preiss.* n. 2432, which I have not seen, does not appear from the description given, to differ from *O. vaginata*.

2. *O. spermacoea*, *Labill. Pl. Nov. Holl.* i. 35. t. 47. A small bushy erect shrub or undershrub, glabrous or slightly pubescent, the short erect branches usually shining. Leaves narrow-linear, often clustered in the axils, mostly short but sometimes above $\frac{1}{2}$ inch long. Stipules often with linear leaf-like points. Flower-heads all pedunculate, small, with few flowers but compound. Calyx-lobes acuminate, rigid, sometimes enlarged and lanceolate when in fruit. Corolla scarcely exceeding the calyx-lobes. Seeds ovoid, obtusely angular, granular-tuberculose, like those of *O. vaginalis*, but without the lateral appendages.—DC. Prod. iv. 615.

W. Australia, *Labillardière*; Port Gregory, Champion Bay, *Oldfield*.

3. *O. scabrida*, *Schlecht. Linnaea*, xx. 604. Erect or ascending, rather slender, scabrous-pubescent or hirsute. Leaves linear-lanceolate or narrow-oblong, usually narrowed at both ends and under $\frac{1}{2}$ in. long. Flower-heads globular, compound, on long erect peduncles in the forks, with 2 or 3 linear floral leaves close under them. Calyx-lobes subulate-acuminate. Seeds small, obovoid, obtusely 3- or 4-angled.

Victoria. Grampians, *F. Mueller*, Wimmera, *Idalphy*, Portland, *Albutt*; Glenelg river, *Robertson*.

S. Australia. Sandy scrub, *Behr*; Lofty Ranges, *F. Mueller*.

4. *O. hirsuta*, *F. Muell. Herb.* Erect, with virgate stems of about 1 ft., covered as well as the foliage with long soft almost silky hairs. Leaves few, linear, obtuse, $\frac{1}{2}$ to 1 in. long. Flower-heads globular, on erect peduncles, with numerous small flowers. Calyx-lobes scarcely so long as the hirsute corollas. Anthers smaller and style shorter than in most species. Seeds oblong-ovoid, obtusely 4-angled, very rugose except the 2 lateral smooth angles.

W. Australia. Lucky Bay, Oldfield and Young rivers, Esperance Bay, *Marwell*.

5. *O. aspera*, *Gærtn. Fruct. i. 112. t. 24.* A rather coarse or slender species, 1 to 2 ft. long or more, glabrous or scabrous-pubescent, varying much in foliage. In the original form leaves shortly petiolate, ovate or ovate-lanceolate, very scabrous on the upper side, glabrous or pubescent underneath, mostly $\frac{1}{2}$ to $1\frac{1}{2}$ in. long. Flower-heads globular, compound, on short recurved peduncles. Calyx-lobes linear-lanceolate. Corolla funnel-shaped, about 2 lines long, the lobes varying as in other species from 3 to 5. Stamens as many as corolla-lobes or fewer. Style-branches occasionally reduced to 1. Seeds ovate, rugose, the inner face much flattened but with 2 longitudinal smooth ribs, one on each side of the prominent rugose centre. —*O. paleata*, Young in Trans. Linn. Soc. iii. 30. t. 5; DC. Prod. iv. 616; *O. ocyminifolia*, Juss. in Ann. Mus. Par. iv. 428. t. 71. f. 3; DC. l. c.

Queensland. Burnett river and Moreton Bay, *F. Mueller*.

N. S. Wales. Botany Bay, *Banks and Solander*; Port Jackson, *R. Brown*, and others; Twofold Bay, *F. Mueller*.

Victoria. Entrance of Genoa River and mouth of Suowy River, *F. Mueller*; Wimmera, *Dallachy*.

Var. *ligustrifolia*. Leaves lanceolate, acutely acuminate, thinner and less scabrous than in the original form. —*O. ligustrifolia*, Juss. in Ann. Mus. Par. iii. 428. t. 71. f. 2 (from the char. and fig.); DC. Prod. iv. 616; *O. rubioides*, Sieb. Pl. Exs., but scarcely of Jussien. —Port Jackson to the Blue Mountains, *Sieber*, n. 251, *Woolfs*, and others.

Var. *hyssopifolia*. Leaves smaller, narrow-lanceolate and thin. —*L. hyssopifolia*, Juss. in Ann. Mus. Par. iii. 428. t. 71. f. 1; DC. Prod. iv. 616. —Queensland coast, *Banks and Solander*, *R. Brown*, *Bowen*, *Dallachy*; Port Jackson to the Blue Mountains, *Woolfs*, and others. This variety much resembles *O. diphylla* in foliage, but the seeds are those of *O. aspera*.

6. *O. hispida*, *Spreng. Syst. Veg. i. 385.* Usually smaller than *O. aspera*, and more hirsute. Leaves petiolate, ovate or lanceolate, either very hirsute and scarcely scabrous or very scabrous, mostly about $\frac{1}{2}$ in. long. Flower-heads on short recurved peduncles, smaller than in *O. aspera*, and the calyx-lobes rather shorter. Seeds of the shape of those of *O. aspera*, concave and rugose on the inner face with the centre projecting, but (as far as known) without the two prominent smooth ribs of that species. —DC. Prod. iv. 615; *O. aspera*, Juss. in Ann. Mus. Par. iv. 427. t. 70. f. 1; *O. hispidula*, Miq. in Ned. Kruidk. Arch. iv. 108, not of Endl.

N. S. Wales. Botany Bay, *Banks and Solander*; Port Jackson, *R. Brown*, and others; New England, *C. Stuart*; Castlereagh, *C. Moore*.

S. Australia. Fifteen Mile Creek, *F. Mueller*.

O. hirtella, DC. Prod. iv. 616, may be a form either of this species or of *O. hispidula*, but is insufficiently described for identification.

7. *O. diphylla*, *Gærtn. Fruct. i. 113.* Slender and nearly glabrous,

resembling the weaker forms of *O. aspera*, var. *hyssopifolia*. Leaves linear or linear-lanceolate, attenuate at both ends. Flower-heads nearly sessile at the forks but reflexed, much smaller than in *O. aspera*, and the calyx-lobes much shorter. Seeds very much pitted-rugose on the inner face, without the two smooth ribs of *O. aspera*.—*O. sessiliflora*, Juss. in Ann. Mus. Par. iv. 427. t. 70. f. 2; DC. Prod. iv. 615.

Queensland. Bay of Inlets, *Banks and Solander*; Brisbane river, Moreton Bay, *F. Mueller*; Rockhampton, *Dallachy*.

N. S. Wales. Botany Bay, *Banks and Solander*.

8. *O. ovata*, Hook. f. in Hook. Lond. Journ. vi. 465, and Fl. Tasm. i. 166. t. 38. Diffuse, spreading from a few inches to about 1 ft., glabrous or scabrous-pubescent. Leaves petiolate, ovate or lanceolate, mostly about $\frac{1}{2}$ in. but sometimes $\frac{3}{4}$ in. long. Heads small, nearly sessile in the forks or on short recurved peduncles. Calyx-lobes usually 3, shorter and broader than in *O. aspera*. Seeds broad, smooth outside, and nearly so on the inner face.

Victoria. Wilson's Promontory and near Brighton, *F. Mueller*; Wendu valley, Glenelg river, *Robertson*.

Tasmania. Near Launceston, in stiff clay soil, *Gunn*.

S. Australia. Lofty Ranges, *F. Mueller*.

9. *O. varia*, Hook. f. in Hook. Lond. Journ. vi. 466, and Fl. Tasm. i. 167. Either small and diffuse or with wiry stems ascending to nearly 1 ft., glabrous, scabrous or hirsute. Leaves very shortly petiolate, oblong lanceolate or almost linear, usually acute, rarely $\frac{1}{2}$ in. long and often much smaller. Flower-heads small, sessile in the forks or nearly so, recurved. Capsules usually only 3 or 4 to each partial head. Seeds broad, not very rugose, the inner face concave with denticulate margins and 2 prominent longitudinal ribs.—*O. eclipioides*, *F. Muell.*; *Miq.* in Ned. Kruidk. Arch. iv. 110.

N. S. Wales? Port Jackson, *R. Brown*.—A specimen which appears to belong to the long slender form of this species, but not in seed.

Victoria. Portland, *Allitt*; Glenelg river, *Robertson*; Latrobe river, *F. Mueller*.

Tasmania. Very common in dry stony places throughout the colony, *J. D. Hooker*.

S. Australia. South coast, *R. Brown*; Rivoli Bay, Mount Disappointment, etc., *F. Mueller*.

Var. *rigidior*. Stems more rigid and virgate. Leaves small, linear.—*O. turpis*, *F. Muell.*; *Miq.* in Ned. Kruidk. Arch. iv. 109; *A. hyssopifolia*, *Miq.* l. c., not of Juss.—About Adelaide, etc., *F. Mueller*.

10. *O. rubioides*, Juss. in Ann. Mus. Par. iv. 428 (from the char. given). Glabrous, rather stout and rigid, apparently erect and perhaps woody at the base. Leaves sessile, ovate-lanceolate or lanceolate, acute, $\frac{1}{2}$ to 1 in. long or rather more, the margins recurved, the upper surface scabrous. Flowers numerous, in globular heads on short recurved peduncles or nearly sessile. Calyx-lobes lanceolate. Seeds not seen.—DC. Prod. iv. 616.

W. Australia. Towards Cape Riche, *Drummond*, 5th Coll. n. 435.—This accords better with Jussieu's character, especially as to the sessile leaves, than any of the forms of *O. aspera*, which have been sometimes supposed to be his plant.

11. *O. volubilis*, *R. Br. Herb.* Glabrous or nearly so, the stems twining and attaining several feet. Leaves petiolate, lanceolate or ovate-lanceo-

late, narrowed into a long point, often above 2 in. long. Heads many-flowered, on short recurved peduncles. Calyx-lobes subulate-acuminate, often 3 lines long. Seeds broad, with a prominent ridge on the inner face, but not seen ripe.

W. Australia. Drummond, 2nd Coll. n. 236; King George's Sound, R. Brown; Princess Royal Harbour, Maxwell.

12. **O. hispidula**, Endl. in Hueg. Enum. 58. A rather coarse species, more or less hirsute with scattered hairs, the stems weak or ascending, often several feet long. Leaves petiolate, from ovate to lanceolate, acute or acuminate, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, sprinkled with rather long hairs on both sides. Flower-heads compound, usually on very short recurved peduncles or almost sessile, rarely on longer peduncles in the primary forks. Calyx-lobes subulate. Seeds ovoid, obtusely 4-angled, very rugose, almost muricate, but only seen in the few-flowered variety.—Bartl. in Pl. Preiss. i. 369.

W. Australia. Swan River, Drummond, 1st Coll., Preiss. n. 2131; Australind and Cape Naturaliste, Oldfield.

Var. *pauciflora*. Flower-heads smaller with fewer flowers, and the plant usually less hairy. *O. pauciflora*, Endl. in Hueg. Enum. 57; King George's Sound, A. Cunningham, Harvey, Oldfield.

It appears that Huegel's many-flowered form was from King George's Sound, and the few-flowered one from Swan River. Our specimens are the reverse.

O. purpurea, Bartl. in Pl. Preiss. i. 369, from Darling range, Preiss. n. 2430, is unknown to me, but the description given applies very well to several of our specimens of *O. hispidula*.

13. **O. echinocephala**, Benth. Erect or diffuse, much-branched, very hispid with short spreading hairs, and not drying black like the other species. Leaves ovate-lanceolate or linear, very shortly petiolate, mostly $\frac{1}{2}$ to $\frac{3}{4}$ in. long, very scabrous-hispid, with recurved margins. Heads numerous, globular, compound, many-flowered, on very short recurved peduncles or nearly sessile, the terminal ones sessile within the last leaves. Calyx-lobes lanceolate-subulate, hispid, rigid, giving the heads a very echinate appearance. Seeds ovate-oblong, scarcely rugose, the inner face nearly flat, with a very prominent smooth longitudinal rib on each side of the central ridge.

W. Australia. Swan River, Drummond, 1st Coll.; Harvey river, Oldfield.

14. **O. apiciflora**, Labill. Pl. Nov. Holl. i. 35. t. 48. Stems slender and diffuse, or erect and twiggy, or flexuose, sometimes almost leafless, glabrous or sprinkled with a few small hairs. Leaves linear or linear-lanceolate, very acute, usually few and small, rarely exceeding $\frac{1}{2}$ in. Peduncles very short and recurved, with a simple head of 3 to 5 flowers. Calyx-lobes acuminate. Corolla very short, campanulate. Seeds ovate, the inner face very concave with denticulate margins and a very prominent central sulcate longitudinal rib.—DC. Prod. iv. 615.

W. Australia, Labillardière. Swan River, Drummond, n. 437; N. of Murchison river, Oldfield.—Some almost leafless specimens of *O. vaginata* have some resemblance to this species, but are not so slender, and the seed is very different.

24. POMAX, Soland.

Flowers connate by the calyx-tubes in simple heads, of which several are

pedicellate in a terminal umbel. Calyx-lobes about 3. Corolla-tube short, lobes 3 to 5, valvate. Stamens 5 or fewer, inserted at the base of the corolla-tube; filaments long; anthers exserted. Ovary 1-celled, with 1 erect ovule; style filiform, deeply divided into 2 long exserted filiform hispid branches, one sometimes abortive. Fruit a 2-valvate capsule, the outer valves of all the capsules united in a persistent cup crowned by the outer calyx-lobes, the inner valves united in a deciduous operculum.—A small shrub or undershrub. Stipules interpetiolar.

The genus is limited to a single species, endemic in Australia, only differing from *Opercularia* in the simple flower-heads forming an umbel, instead of being united in a compound head.

1. **P. umbellata**, Soland. in Gartn. Fruct. i. 112. Much-branched, diffuse or erect, usually not exceeding 1 ft. in height, more or less hirsute or rarely glabrous. Leaves petiolate, ovate, elliptical or lanceolate, mostly under $\frac{1}{2}$ in. long or rather more when narrow. Umbel terminal, sessile within the last leaves; rays or peduncles 2 to 3 lines long when in flower, longer when in fruit, each bearing a head usually of about 3 or 4 flowers. Corolla about $1\frac{1}{2}$ lines long. Persistent cup (formed by the outer fruit-valves, but often called an involuere) campanulate, 1 to $1\frac{1}{2}$ lines long, bordered by 5 to 8 ovate spreading teeth (the outer calyx-lobes), the inner calyx-lobes much smaller or scarcely conspicuous on the top of the deciduous operculum. *Opercularia umbellata*, Gartn. Fruct. i. 112. t. 24; *Pomax hirta* and *P. glabra*, DC. Prod. iv. 615; *P. rupestris*, F. Muell. in Linnæa, xxv. 395.

Queensland. Sutor, Burdekin, and Burnett rivers, F. Mueller; Rockhampton, Dal-
lachy; Brisbane river, Moreton Bay, F. Mueller; on the Maranoa and near Mount Pluto,
Mitchell.

N. S. Wales. Port Jackson to the Blue Mountains, R. Brown, Sieber, n. 250, and
others; New England, C. Stuart; Arne river, Beckler; and in the interior on the Lachlan,
A. Cunningham; and Darling river, Victorian Expedition.

Victoria. Buffalo range, Snowy and Avon rivers, F. Mueller.

S. Australia. Near Lake Torrens, F. Mueller; Lake Gillies, Burkitt.

25. ELEUTHRANTHES, F. Muell.

Flowers in heads but not concrete. Calyx-limb 4- or 5-lobed. Corolla-tube slender; lobes 4 or 5, valvate in the bud. Stamens 5 or fewer, inserted on the base of the corolla-tube; anthers exserted. Ovary 1-celled, with a single erect ovule; style deeply divided into 2 long filiform branches. Fruits not concrete, capsular, opening apparently in 2 valves. Seed obovate, compressed, but not seen ripe.—A small herb. Stipules reduced to a short sheath. Flower-heads dense, terminal, globular.

The genus is limited to a single species, endemic in Australia.

1. **E. opercularina**, F. Muell. Fragm. iv. 92. A small procumbent very hirsute annual, spreading to a few inches diameter. Leaves petiolate, ovate, mostly acute, under $\frac{1}{2}$ in. long, hirsute with long soft hairs. Flowers very numerous, in dense globular hirsute heads of $\frac{1}{2}$ in. diameter or rather more, sessile above the last leaves but without any other bracts or involuere. Calyx-lobes linear or subulate, hirsute, 1 to $1\frac{1}{2}$ lines long. Corolla about

1 line long, the lobes very short, slightly hairy. Young seeds white and rugose.—*Opercularia liberiflora*, F. Muell. l. c.

W. Australia. Rocks on the Fitzgerald river, *Marwell*.

SUBTRIBE VII. SPERMACOCEÆ.—Corolla-lobes valvate. Ovules variously attached to the axis, the ovary usually perfectly 2-celled. Style-lobes short. Fruit capsular or indehiscient and dry. Albumen copious.—Herbs, undershrubs, or rarely shrubs.

26. KNOXIA, Linn.

Calyx-limb of 4 minute persistent teeth. Corolla-tube slender; lobes 4, valvate in the bud. Anthers scarcely exerted. Ovary 2-celled, with 1 pendulous ovule in each cell; style with 2 short stigmatic lobes. Fruit small and dry, the 2 carpels either separating from the base upwards or falling off together, leaving a persistent filiform axis.—Herbs or undershrubs. Stipules 1 on each side, usually fringed with bristle-like teeth. Flowers in terminal cymes or corymbs, the branches often lengthened into one-sided spikes.

A small genus, extending over tropical Asia and Africa, the only Australian species being the most common one in Asia.

1. *K. corymbosa*, Willd.; *W. and Arn. Prod.* i. 439. A perennial usually erect, 1 to 2 ft. high, often almost woody at the base, more or less pubescent and but little branched. Leaves oblong-lanceolate or rarely nearly ovate, 2 to 3 in. long. Flowers 1 to 1½ lines long, numerous, in loose terminal cymes. Capsule ovoid, about 1 line long, usually falling off entire from the filiform persistent axis.—Wight, *Illustr. t.* 128.

Queensland. E. coast, *R. Brown*; Palm Island, *Henne*; Rockhampton, *Thozet* and others; Pine river, *Herb. P. Mueller*.—Common in tropical Asia, from Ceylon and the Peninsula to the Archipelago. The Australian specimens have smaller flowers than usual, but I have not seen the corollas well opened.

27. SPERMACOCE, Linn.

(*Borreria*, *G. F. W. Mey.*; *Bigelowia*, *Spreng.*)

Calyx-limb of 4 or rarely only 2 teeth or small lobes. Corolla-tube short or rarely slender; lobes 4, valvate in the bud. Anthers exerted or rarely included in the tube. Ovary 2-celled, with 1 ovule in each cell, laterally attached or ascending; style entire or with 2 short stigmatic lobes. Capsule small, separating into 2 carpels more or less opening on their inner face, or leaving more or less of the dissepiment free or attached to one of the carpels. Seeds marked on the inner face by a longitudinal furrow, concavity, or broad opaque surface containing the hilum.—Herbs or rarely undershrubs. Stipules shortly sheathing, bordered with bristle-like teeth. Flowers small, clustered in the axils of the leaves or in terminal heads.

A large genus, widely spread over the tropical and subtropical regions both of the New and the Old World, some species being amongst the commonest of the tropical weeds, but none of these, not even the widely-spread Asiatic and African *S. stricta* or *S. hispida*, have as yet been observed in Australia, the whole of the Australian species being as far as known.

endemic. Varying in the dehiscence of the capsule from that ascribed to *Borreria* to that of *Spermucoce* proper, their inflorescence is that most prevalent in *Borreria*: the heads are terminal, or if axillary only on one side of the stem, showing that they have become lateral only by the elongation of one only of the branches of a normally forked stem. The shape of the corolla and insertion of the stamens appear to be constant characters, and essential to be attended to in the determination of species otherwise similar in aspect. The length of the stamens may vary from dimorphism.

Stamens inserted at the base or below the middle of the corolla-tube, the anthers always included. Corolla 1 to 1½ lines long.

Leaves linear, lanceolate or narrow-elliptical. Stems erect, divaricate or scarcely diffuse. Stamens at the base of the tube.

Corolla-lobes much shorter than the tube 1. *S. brachystema*.

Corolla-lobes longer than the tube.

Corolla densely bearded at the throat. Anthers small, ovate 2. *S. pogostoma*.

Corolla not bearded, the narrow lobes pubescent inside.

Anthers oblong 3. *S. leptoloba*.

Leaves ovate or broadly lanceolate, rigid, with callous margins.

Stamens near the middle of the tube 4. *S. marginata*.

Stamens inserted at the orifice of the corolla-tube, alternating with its lobes.

Calyx usually 4-lobed. Corolla-lobes without internal appendages.

Annual or perennial herbs.

Corolla-lobes longer than the short broad tube.

Leaves linear or linear-lanceolate.

Corolla about 1 line long. Stamens much shorter than the lobes 5. *S. multicaulis*.

Corolla about 2 lines long. Stamens as long as or longer than the lobes 6. *S. exserta*.

Leaves ovate or elliptical, on long petioles. Stamens exceeding the corolla-lobes 7. *S. membranacea*.

Corolla-lobes shorter than the tube.

Stems diffuse. Leaves petiolate, ovate or broadly lanceolate.

Corolla nearly 2 lines long. 8. *S. debilis*.

Stems erect or ascending. Leaves narrow-linear.

Flowers about 4, in terminal and lateral heads. Corolla about 3 lines long. Cocci almost closed 9. *S. inaperta*.

Flowers numerous, in heads chiefly terminal.

Corolla about 3 lines long; lobes nearly as long as the tube 10. *S. stenophylla*.

Corolla about 4 lines long; lobes a little more than half as long as the slender tube 11. *S. lavigata*.

Calyx usually 4-lobed. Corolla-lobes with 2 oblique prominent laminae or auricles on the inner face. Leaves linear or lanceolate. Annual or perennial herbs.

Corolla 2½ to 3 lines long, the lobes about as long as the tube . 12. *S. breviflora*.

Corolla 5 to 6 lines long, the lobes shorter than the tube . . 13. *S. auriculata*.

Calyx 2-lobed. Corolla-lobes without appendages. Undershrub. 14. *S. suffruticosa*.

(The common Asiatic *S. stricta*, Linn. f., may possibly have been found in Queensland. It differs from *S. multicaulis* in the funnel-shaped corolla, with lobes much shorter than the tube.)

1. ***S. brachystema*, R. Br. Herb.** An erect or spreading rather rigid annual, attaining 1 or 2 ft. and not much branched, or sometimes much smaller, more or less pubescent or hirsute, or sometimes nearly glabrous. Leaves sessile, linear-lanceolate or rarely oblong, mostly 1 to 1½ in. long, occasionally clustered in the axils. Bristles of the stipules rather long. Flowers small, in dense terminal or lateral heads or clusters. Calyx-lobes 4,

acute, often unequal, the longer ones as long as the tube. Corolla about 1 line long, bearded inside at the orifice of the tube, the lobes very short. Anthers small, ovoid, on very short filaments at the base of the tube. Capsule about $1\frac{1}{2}$ lines long, more or less of the dissepiment remaining attached to one of the carpels after dehiscence.—*S. stricta*, F. Muell. Fragm. iv. 41, not of Linn.

N. Australia. Arnhem's Land, *F. Mueller*; Port Essington, *Armstrong*.

Queensland. E. coast, *R. Brown*; Port Denison, *Fitzalan*; Burnett river and Brisbane river, Moreton Bay, *F. Mueller*; Rockhampton, *Thozet*, *Dallachy* (the latter with rather broader leaves and more hirsute).

2. ***S. pogostoma*, Benth.** Annual, erect, and quite glabrous. Leaves linear or linear-lanceolate. Stipular bristles rather long. Flowers small, not very numerous, in terminal and lateral heads. Calyx-lobes lanceolate, very acute, almost pungent, longer than the tube, and almost as long as the corolla. Corolla a little more than 1 line long, deeply coloured when dry, very densely bearded inside at the orifice of the tube; lobes longer than the tube, inflexed at the tips. Anthers small, ovate, almost sessile at the base of the tube as in *S. brachystema*.

N. Australia. Sturt's Creek, *F. Mueller*; Amity Creek (*McDonall Stuart?*) *Herb. F. Muell.*

3. ***S. leptoloba*, Benth.** Annual, divaricately-branched, scabrous-pubescent. Leaves lanceolate or elliptical, 1 to 2 in. long, acuminate and narrowed at the base, with a few very oblique veins prominent underneath. Stipular bristles very fine and not very long. Flowers numerous, in dense terminal or rarely lateral heads, intermixed with numerous cilia. Calyx-lobes lanceolate-subulate, longer than the tube, and at least as long as the corolla. Corolla about $1\frac{1}{2}$ lines long, the tube broad and nearly glabrous inside; lobes very narrow, longer than the tube, pubescent inside, at least above the middle. Anthers oblong, much larger than in the allied species, inserted at the base of the tube. Fruit about 1 line long, smooth and white, the calyx-lobes on the summit assuming a bluish hue in the dried specimens.

N. Australia. Port Essington, *Armstrong*.—The flowers appear to be more or less unisexual, the females often without any traces of stamens, and the males with a slender abortive ovary.

4. ***S. marginata*, Benth.** Prostrate, rigid, glabrous and smooth, or the angles of the stem and margins of the leaves scabrous. Leaves sessile, ovate to broadly lanceolate, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, mucronate-acute, rigid, undulate, with thickened callous margins. Stipular sheath very short, with rigid bristles. Flowers numerous, in dense terminal or lateral heads. Calyx-lobes lanceolate, rigidly acuminate, longer than the tube, and usually exceeding the corolla. Corolla about 1 line long, the tube very broad, glabrous inside; lobes longer than the tube, inflexed and thickened at the end, bearded inside at the base. Stamens inserted about halfway up the tube and included in it. Carpels opening inside to the base.

Queensland. N.E. coast, *Banks and Solander*, *A. Cunningham*; Howick's Isles, *Macgillivray*, *F. Mueller*.

5. ***S. multicaulis*, Benth.** Annual or with a perennial almost woody base and erect rigid stems, glabrous and smooth or minutely scabrous-

pubescent. Leaves sessile, linear, with revolute margins. Stipular sheath very short. Flowers in small but dense terminal or at length lateral clusters or heads. Calyx-lobes thick, obtuse, incurved, as long as the tube and nearly as long as the corolla. Corolla not above 1 line long, usually pubescent outside, the tube slightly hairy inside; lobes longer than the tube, thickened towards the end. Stamens inserted at the orifice of the tube; anthers oblong, not exceeding the lobes. Carpels opening nearly to the base.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown* (with rather larger flower-heads).

Queensland. Barnett river, *F. Mueller*; Broadsound and Bowen river, *Barman*; Brisbane river, *A. Cunningham*.

The flowers are nearly those of *S. semierecta*, Roxb., but the foliage is very different. In the latter respect it resembles the narrow-leaved form of *S. striata*, Linn., but differs in the flowers.

6. ***S. exserta*, Benth.** Apparently annual, erect, more or less hirsute. Leaves long-linear or linear-lanceolate. Stipular bristles rather long and fine. Flowers in dense globular terminal or sometimes lateral heads. Calyx-lobes lanceolate, ciliate, much longer than the tube, and often nearly as long as the corolla, the tube hirsute with almost scale-like bristles. Corolla nearly 3 lines long, the tube short and broad, the lobes much longer, lanceolate. Stamens inserted at the orifice of the tube, as long as or much longer than the lobes. Fruit only seen young.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Croker's Island, *A. Cunningham*; Port Essington, *Armstrong*.

7. ***S. membranacea*, R. Br. Herb.** A slender annual, sprinkled with minute hairs or nearly glabrous. Leaves on rather long petioles, ovate or elliptical, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, thin and membranous. Stipular sheath very short, with very fine often long bristles. Flowers very small, in small terminal heads. Calyx-lobes lanceolate, shorter than the corolla. Corolla white, scarcely above 1 line long, the lobes longer than the tube. Stamens inserted at the orifice of the tube, exceeding the lobes. Fruit not seen.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

8. ***S. debilis*, Benth.** Slender and diffuse, probably annual, glabrous or minutely scabrous. Leaves petiolate, ovate or oblong-lanceolate, obtuse or scarcely acute, not rigid, under $\frac{3}{4}$ in. and mostly under $\frac{1}{2}$ in. long. Flowers numerous, in dense heads mostly terminal. Calyx-lobes lanceolate-subulate, longer than the tube. Corolla nearly 2 lines long; tube cylindrical, slightly hairy inside but not at the orifice; lobes pubescent outside, very much shorter than the tube. Stamens inserted at the orifice of the tube, and shorter than the lobes. Fruit small, the carpels opening to the base.

Queensland. Sir Charles Hardy's Island, *Hence*.—The habit is quite that of a Malacca species in Griffith's collection, but the corolla is very much larger and differently shaped.

9. ***S. inaperta*, F. Muell. Fragm. iv. 43.** An annual with ascending or erect, rigid, but slender branches of 1 ft. or more, glabrous and smooth in our specimens. Leaves sessile, narrow-linear, with revolute margins. Stipular sheaths rather large and scarious, the bristles fine and rather short.

Flowers only about 4 together in axillary sessile clusters, numerous but only in one axil of each pair of leaves. Calyx pubescent; lobes linear-lanceolate, acute. Corolla funnel-shaped, about 3 lines long, glabrous inside, the lobes rather shorter than the tube. Stamens inserted at the orifice of the tube, shorter than the lobes. Fruit-carpels separating, and not always opening on their inner face.

N. Australia. Grassy places, Lower Victoria river, *F. Mueller*.

10. *S. stenophylla*, *F. Muell. Fragm.* iv. 43. Apparently perennial, with erect scarcely branched stems, glabrous and smooth. Leaves long, narrow-linear. Stipular sheaths scarious, rather long, the bristles usually short. Flowers in dense globular terminal or occasionally lateral heads. Calyx-lobes lanceolate, acute, rigidly ciliate, longer than the very short tube. Corolla funnel-shaped, 3 lines long, slightly bearded at the throat, the lobes nearly as long as the tube. Stamens inserted at the orifice of the tube, nearly as long as the lobes. Capsule a little more than 1 line long, the carpels opening at the top.

N. Australia. Sweers Island, Gulf of Carpentaria, *Henne*.

11. *S. lævigata*, *F. Muell. Fragm.* iv. 41. Apparently perennial, glabrous and smooth, or hispid with a few scattered rigid hairs, the stems erect, slightly branched, slender but rigid. Leaves long, linear. Stipular bristles remarkably long. Flowers in dense terminal heads. Calyx-lobes lanceolate-subulate, acute, more than twice as long as the tube. Corolla nearly 4 lines long, the tube long and slender, slightly dilated upwards; lobes oblong-linear, rather above half as long as the tube. Stamens inserted at the orifice of the tube, and nearly as long as the lobes. Carpels opening upwards.

N. Australia. Stony and grassy banks of Victoria river, Wickham's Creek, and Depot Creek, *F. Mueller*.

Var. (?) *hispidula*. Whole plant more or less hispid. Leaves very acute, often above 2 in. long.—*S. purpureo-cerulea*, *R. Br. Herb.* Gulf of Carpentaria, *R. Brown*.

Var. (?) *dilatata*. Calyx-lobes shorter. Floral leaves much dilated and coloured at the base.—Islands of the Gulf of Carpentaria, *R. Brown*.

12. *S. breviflora*, *F. Muell. Herb.* Annual, diffuse, and more or less hirsute. Leaves linear or linear-lanceolate, with recurved margins. Flowers in very dense terminal globular heads, often above $\frac{1}{2}$ in. diameter. Calyx-lobes lanceolate or lanceolate-subulate, much longer than the tube. Corolla from $2\frac{1}{2}$ to about 3 lines long, the lobes about as long as the rather broad tube, with the internal appendages of *S. auriculata*, but more oblique and often united into one, at least at the base, occupying altogether $\frac{1}{3}$ of the lobe. Calyx-lobes usually recurved in the fruiting-head.

N. Australia. Victoria river and Depot Creek, *F. Mueller*; Arnhem N. Bay and islands of the Gulf of Carpentaria, *R. Brown*; Attack Creek, *M'Donall Stuart* (with rather larger flowers).

13. *S. auriculata*, *F. Muell. Fragm.* iv. 42. Low and diffuse or tall and slightly branched, more or less hispid, and sometimes very rigidly so. Leaves linear or lanceolate. Stipular bristles rather long. Flowers in dense terminal globular heads, often above $\frac{1}{2}$ in. diameter. Calyx-lobes long and subulate. Corolla 6 lines long, the tube long and slender; bearded inside.

dilated at the top into a campanulate limb, the lobes shorter than the tube, each with a pair of oblique prominent glandular-toothed appendages on the inner face at about half their length. Stamens inserted at the orifice of the tube, shorter than the lobes. Capsule rather thin, the carpels opening at the top, a portion of the dissepiment remaining attached to one of them.

N. Australia. N. coast, *R. Brown*; Upper Victoria river, *F. Mueller*; Port Essington, *Armstrong* (with long linear glabrous or hirsute leaves).

14. ***S. suffruticosa*, R. Br. Herb.** A rigid glabrous undershrub, with erect stems of about 1 ft. Leaves linear, clustered in the axils. Stipular sheaths short, with about 2 bristles on each side dilated at the base, and sometimes united into a single lanceolate point. Flower-heads terminal and lateral, forming a short forked cyme at the ends of the branches. Calyx-lobes 2 only, short, linear. Corolla $2\frac{1}{2}$ or nearly 3 lines long, the lobes spreading, as long as the tube, with a longitudinal line of hairs inside each. Stamens inserted at the orifice of the tube, and rather longer than the lobes. Fruits obovoid, hard, the carpels separating, the dissepiment remaining attached to one of them.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

TRIBE III. STELLATE.—Calyx wholly adnate without any visible border (in the Australian genera). Corolla-lobes valvate. Ovary 2-celled, with 1 ovule in each cell. Fruit small, indehiscent.—Herbs, rarely undershrubs. Stipules similar to the leaves, and connected with them by a short sheath or ring, forming whorls of 4 or more, very rarely (only in two Australian species) reduced to the 2 true leaves.

28. ASPERULA, Linn.

Calyx completely combined with the ovary, without any visible border. Corolla funnel-shaped, with a distinct tube and 4 spreading lobes, valvate in the bud. Anthers exserted. Style 2-lobed. Ovary 2-celled, with 1 ascending or laterally attached ovule in each cell. Fruit small, dry, 2-lobed (when perfect), indehiscent.—Herbs with slender quadrangular stems. Leaves in whorls of 4 to 8, of which 2 are real leaves and the remainder stipules, although precisely similar in shape and size, in one species reduced to the 2 real leaves. Flowers small, solitary, or in axillary or terminal cymes or clusters, occasionally more or less unisexual, the females with a much shorter corolla-tube than the males, but always more prominent than in *Galium*.

The genus extends over the cooler temperate and subtropical regions of the Old World, but is unknown in America or southern Africa. The Australian species are all endemic. It differs from *Galium* only in the shape of the corolla.

- | | |
|---|----------------------------|
| Leaves mostly in pairs | 1. <i>A. geminifolia</i> . |
| Leaves all or nearly all in fours | 2. <i>A. subsimplex</i> . |
| Leaves mostly in sixes, a few whorls sometimes of four only. | |
| Leaves narrow-linear, with fine points. Plant usually scabrous-hispid | 3. <i>A. scoparia</i> . |
| Leaves linear, obtuse or acute, minutely pubescent | 4. <i>A. conferta</i> . |
| Leaves obovate, oblong or oblong-linear, obtuse | 5. <i>A. Gunnii</i> . |
| Leaves mostly in eights, about 1 line long. Stems short, filiform | 6. <i>A. minima</i> . |

1. ***A. geminifolia*, F. Muell. Fragm. v. 147.** Stems long, slender,

weak and diffuse, quite glabrous. Leaves 2 or very rarely 3 to each whorl, narrow-linear, acute, above 1 in. long in luxuriant specimens, but usually shorter. Peduncles terminal, elongated, solitary or 3 together, each with about 5 to 7 flowers, almost sessile, in a small cyme. Corolla about $\frac{3}{4}$ line long, the lobes nearly as long as the tube. Fruit small, very rugose, almost fleshy.

Queensland. Burdekin and Brisbane rivers, *F. Mueller*; Cannon's River, *Bowman*.

2. **A. subsimplex**, *Hook. f. in Hook. Lond. Journ.* vi. 463, and *Fl. Tasm.* i. 168. Small, slender, diffuse and glabrous. Leaves in all our specimens constantly four in each whorl, linear, acute or scarcely obtuse, rarely exceeding $\frac{1}{2}$ in., the upper ones very short and rather broader. Flowers very shortly pedicellate, solitary in the upper axils or about 3 together at the ends of the branches. Corolla about $\frac{3}{4}$ line long, the lobes nearly as long as the tube. Young fruit rugose, but not seen ripe.

Tasmania. Circular Head, Formosa, Lake St. Clair, etc., *Lawrence, Gunn*.

3. **A. scoparia**, *Hook. f. in Hook. Lond. Journ.* vi. 463, and *Fl. Tasm.* i. 169. *t.* 40A. Stems short and densely tufted, erect or decumbent, or in the northern specimens 6 in. long or more, and rather rigid, the whole plant more or less scabrous-pubescent. Leaves 6 in a whorl, linear, acute, with a fine point, mostly 3 to 4 lines long. Flowers 3 or 5 together, nearly sessile within the last whorl of leaves, or about 3 together, on short common peduncles, of which 3 to 5 are umbellate within the last whorl. Corolla of the male flowers about 1 line long, with a slender tube, in the females much shorter, the tube scarcely so long as the lobes.—*Rubia syrticola*, *Miq.* in *Ned. Kruidk. Arch.* iv. 111.

Queensland. On the Maranoa, *Mitchell*.

N. S. Wales. New England, *C. Stuart*; near Appin, *Backhouse*.

Victoria. Desert of the Murray, *F. Mueller*.

Tasmania. Dry gravelly fields at Laurennys, *J. D. Hooker*.

S. Australia. Gawler town, Lofty Ranges, Mount Gambier, *F. Mueller*.

4. **A. conferta**, *Hook. f. in Hook. Lond. Journ.* vi. 464, and *Fl. Tasm.* i. 169. Diffuse, decumbent or nearly erect, sometimes forming dense prostrate tufts of a few in., sometimes 6 ft. to 1 ft. long, rigid or slender, nearly glabrous or slightly scabrous-pubescent. Leaves in whorls of 6, linear, almost obtuse or shortly pointed, but without the fine point of *A. scoparia*. Flowers in little terminal cymes or clusters, almost sessile within the last whorl of leaves. Corolla above 1 line long in the males with a slender tube, much shorter with a short broad tube in the females. Fruit smooth or rugose by drying.

Queensland. Peak Downs, *F. Mueller*; near Warwick, *Beckler*.

N. S. Wales. Open plains near Bathurst, *A. Cunningham*; Paramatta, *Woolfs*; Darling river, *Dallachy*.

Victoria. Dry places in the western and north-western parts of the colony, *F. Mueller* and others.

Tasmania. Abundant in dry places throughout the colony, *J. D. Hooker*.

Var. elongata. Stems long and slender. Leaves $\frac{1}{2}$ to $\frac{1}{2}$ in. long, narrow-linear, obtuse. Flowers very small.—Mackenzie and Suttro rivers, *F. Mueller*; New England, *C. Stuart*; Sythe's ranges, *Whan*; Forest Creek, *F. Mueller*.

5. **A. Gunnii**, *Hook. f. in Hook. Lond. Journ.* vi. 463; *Fl. Tasm.* i. 168. Rather small and diffuse, glabrous or slightly pubescent. Leaves mostly in whorls of 6 or here and there of 4, only in slender specimens, oblong-linear or linear-cuneate, usually obtuse, rarely above $\frac{1}{2}$ in. long. Flowers mostly in threes in the upper axils or in a small terminal cluster, rather smaller than in *A. conferta*, but otherwise similar. Fruits globular or didymous, about 1 line diameter, not rugose.

N. S. Wales. Near Appin, *Backhouse*.

Victoria. Dandenong ranges and Mount Cobberas, *P. Mueller*.

Tasmania. Alpine situations, not unfrequent, *J. D. Hooker*.

Var. *pusilla*. Smaller and more branched.—*A. pusilla*, *Hook. f. in Hook. Lond. Journ.* vi. 464, and *Fl. Tasm.* i. 169, t. 40B. Common in alpine and subalpine situations in Tasmania, *J. D. Hooker*.

6. **A. minima**, *Hook. f. in Hook. Lond. Journ.* vi. 464, and *Fl. Tasm.* i. 170. A little slender diffuse plant, forming dense tufts of a few in. diameter, slightly scabrous-pubescent. Leaves 6 to 8 (usually 8) in a whorl, linear, acute, mostly about 1 line long. Flowers all pedicellate, mostly in threes within the last leaves, or 3 peduncles bearing each 3 pedicellate flowers. Corolla in the males about $\frac{3}{4}$ line long, the lobes as long as the tube, scarcely above $\frac{1}{2}$ line long in the females.

Tasmania. Common about George Town, *Gunn*.

29. GALIUM, Linn.

Calyx completely combined with the ovary, without any visible border. Corolla rotate, the tube scarcely perceptible, with 4 spreading lobes valvate in the bud. Anthers exerted. Style deeply 2-cleft. Ovary 2-celled, with 1 ascending or laterally attached ovule in each cell. Fruit small, dry, 2-lobed (when perfect), indehiscent.—Herbs, with weak quadrangular stems. Leaves in whorls of 4 to 8, of which 2 are real leaves and the remainder stipules, although precisely similar in size and shape, in one species reduced to the 2 real leaves. Flowers small, in axillary or terminal trichotomous cymes or panicles, rarely solitary.

An extensive genus, spread over the whole of the temperate regions of the globe, especially abundant in Europe and northern Asia, with very few tropical species, and those chiefly limited to mountain regions. Of the five or six Australian species, one is perhaps the same as a New Zealand one, another is probably introduced from Europe, the remainder appear to be endemic. But the proper discrimination and limitation of species in the whole genus is a very difficult and much disputed question.

Fruit glabrous and smooth or rarely slightly tubercular.

Leaves in pairs 1. *G. geminifolium*.

Leaves in whorls of four.

Flowers white. Leaves narrow or rarely ovate 2. *G. Gandichaudi*.

Flowers yellow. Leaves ovate 3. *G. ciliare*.

Fruit muricate or hispid.

Leaves in whorls of four, mostly ovate or lanceolate.

Plant scabrous or hispid, with short clinging hairs 4. *G. australe*.

Plant densely clothed with soft hairs not at all clinging 5. *G. albescent*.

Leaves in whorls of five or six, usually narrow. Hairs of the plant very clinging 6. *G. Aparine*.

1. **G. geminifolium**, *P. Muell. in Trans. Vict. Inst.* 1855, 147, and

in *Hook. New Journ.* viii. 146; *Pl. Pict.* t. 31. Stems elongated, slender, glabrous or scabrous on the angles. Leaves all in pairs, narrow-linear, mostly obtuse. Flowers very small, about 3 together, sessile within the last leaves or on a common peduncle in the upper axils. Fruits rather large, glabrous and smooth.

N. S. Wales. Darling river, *Victorian Expedition*.

Victoria. Murray and Avoca river, *F. Mueller*.

S. Australia, *Wilhelmi*.

The plant closely resembles *Asperula geminifolia*, but is more rigidly divaricate, and the corolla is that of a *Galium*.

2. **G. Gaudichaudi**, *DC. Prod.* iv. 607. A very variable plant, usually hispid, more rarely glabrous except minute asperities. Stems usually numerous, short erect and densely tufted, or diffuse and extending to 1 or 2 ft. Leaves almost always 4 in a whorl, usually sessile, mostly lanceolate or linear, with recurved margins, 2 to 3 lines long, sometimes, and generally the lower ones, small and ovate, or (when grown in shady places?) thinner, ovate, and much narrowed at the base. Flowers very small, about 3 together, on axillary peduncles, which sometimes grow out irregularly into leafy branches, or the flowers and a few leaves clustered on a very short peduncle. Fruit quite glabrous and smooth when fully ripe, though often appearing rugose when shrivelled in dried specimens.—*G. vugans*, *Hook. f.* in *Hook. Lond. Journ.* vi. 461, and *Fl. Tasm.* i. 170; *G. ariflorum*, *F. Muell.*; *Miq.* in *Ned. Kruidk. Arch.* iv. 113.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; northward to New England, *C. Stuart*; Macleay and Clarence rivers, *Beckler*; open plains of the interior, *A. Cunningham* and others.

Victoria. Dry places in the western and north-western parts of the colony, *F. Mueller* and others.

Tasmania. Dry bushy places, not uncommon, *J. D. Hooker*.

S. Australia. Murray river to St. Vincent's Gulf, *F. Mueller* and others.

The species is closely allied to and may not be really distinct from the New Zealand *G. umbrosum*, *Forst.*

Var. glabrescens. Stems tufted, erect, glabrous or nearly so. Leaves broad.—New England, *Beckler*.

Var. variculatum. Fruit slightly tubercular, connecting the species with *G. australe*.—New England, Clarence river, Paranaatta, Wilson's Promontory, Cadnata, generally single specimens, possibly hybrids.

3. **G. ciliare**, *Hook. f.* in *Hook. Lond. Journ.* vi. 461, and *Fl. Tasm.* i. 170. t. 41. Slender diffuse and more or less hispid, with small ovate leaves in whorls of 4, closely resembling some broad-leaved forms of *G. Gaudichaudi*, and with the same inflorescence, but the flowers are said to be of a bright yellow, a character which proves constant in species of the northern hemisphere. Fruits glabrous and smooth.

Tasmania. Abundant in dry pastures, *J. D. Hooker*.

4. **G. australe**, *DC. Prod.* iv. 608. Slender and diffuse but perhaps perennial, the stems often elongated and much intricate, more or less rough or hispid, with short rigid clinging hairs. Leaves in whorls of 4, from ovate to lanceolate, sessile or shortly contracted at the base. Pedicels rather long, often 3 together, on a short axillary peduncle, with a whorl of leaves

at their base. Flowers of *G. Gaudichaudi*. Fruit small, more or less muricate or cehinate, with hooked bristles.—Hook. f. Fl. Tasm. i. 171; *G. densum*, Hook. f. in Hook. Lond. Journ. vi. 461; *G. erythrorhizum*, F. Muell., Miq. in Ned. Kruidk. Arch. iv. 118.

Queensland. Warwick, *Beckler*.

N. S. Wales. Port Jackson (*Woolfs?*).

Victoria. Wilson's Promontory, *F. Mueller*.

Tasmania. Common in dry pastures, etc., *J. D. Hooker*.

S. Australia. Near Cudnaka and Kangaroo island, *F. Mueller*.

Var. *piloso-hispidum*. Stems and foliage hispid.—*G. squalidum*, Hook. f. in Hook. Lond. Journ. vi. 462, and Fl. Tasm. i. 171.

5. ***G. albescens***, Hook. f. in Hook. Lond. Journ. vi. 462, and Fl. Tasm. i. 171. A slender diffuse plant, very near *G. australe*, but densely clothed with soft hairs not at all prehensile. Leaves small, ovate, in whorls of four. Flowers of *G. australe*. Fruits rather larger, muricate or hispid with hooked bristles.

Tasmania. Rocky places on Mount Wellington, *Gunn*.

6. ***G. Aparine***, Linn.; DC. Prod. iv. 608; var. *minor*. A trailing or climbing annual often several ft. long, but in the Australian specimen under 2 ft., clinging by the recurved asperities or small prickles on the angles of the stems and on the edges and midribs of the leaves. Leaves in the Australian specimens 5 or 6 in the whorl, in the larger forms 6 to 8, linear or linear-lanceolate, often above 1 in. long. Peduncles axillary, bearing a loose cyme of 3 or more small greenish-white flowers, with 3 or 4 leaves at the base of the cyme. Fruits covered with hooked bristles or prickles forming very adhesive burrs.

Victoria. Murray river, *F. Mueller*; Wendu valley, Glenelg river, *Robertson*.

S. Australia. Mount Gambier, *F. Mueller*.

W. Australia. Swan River, *Drummond*, n. 727, *Oldfield*.

The species is common in Europe and northern and central Asia, whence it has been carried with cultivation to most parts of the world, and it is therefore probably introduced only into Australia. Some of the specimens are small and bad, and perhaps not correctly distinguished from imperfect specimens of *G. australe*. The western ones, however, appear to me without doubt to be the *G. Aparine*.

ORDER LXII. COMPOSITÆ.

Flowers or *florets* collected together in a head (rarely reduced to a single floret), surrounded by an involucre of several bracts, either in one row or imbricated in several rows, the whole having the appearance of a single flower. Receptacle on which the florets are inserted either naked or bearing chaffy scales or hairs or bristles between the florets. In each floret the calyx is wanting or converted into a *pappus* or ring of hairs or scales on the top of the ovary. Corollas either all hermaphrodite, tubular, and 5- or rarely 4-toothed (heads *discoïd*), or all hermaphrodite and *ligulate*, that is, with a slender tube and a flat strap-shaped lamina, or those of the centre or *disk* tubular and hermaphrodite or male, and those of the circumference either ligulate and female or neuter, forming a *ray* (heads *radiate*), or filiform and female (heads *discoïd* but *heterogamous*). Stamens 5, rarely 4, inserted in the tube of the corolla, the anthers linear and united in a sheath round the

style (except in *Xanthium* or where more or less imperfect), 2-celled, opening inwards by longitudinal slits, the connective usually produced at the top into a small erect appendage, the anther obtuse or sagittate at the base, the basal lobes sometimes prolonged into short and acute or long very fine and hair-like points or lobes called *tails*. Ovary inferior, with a single erect ovule. Style filiform, usually divided at the top into two short stigmatic branches. Fruit a small dry seed-like nut or *achene*, crowned by the pappus or naked. Seed erect, without albumen. Embryo straight or rarely curved. Radicle inferior.—Herbs shrubs or very rarely small trees, with alternate or opposite leaves, without stipules. Flower-heads terminal or very rarely axillary, solitary or in panicles usually corymbose, sometimes reduced to clusters or compound heads, the general inflorescence often centrifugal, the inflorescence within the head always centripetal.

The most extensive family amongst flowering plants, and represented in every quarter of the globe and in every variety of station, most abundant in America, in Southern Africa, in Australia, and in the Mediterranean region of the northern hemisphere, the species less numerous in proportion in tropical Asia and Africa. After deducting the foreign weeds, which are evidently of recent introduction, the species known as indigenous to Australia, nearly 500 in number, are here arranged under 88 genera. Of these, 9 are widely-spread genera, represented in most countries; 5 belong more specially to the temperate regions of the Old World, and amongst them one (*Leuca*) almost limited out of Australia to the Mediterranean region; 10 belong to the tropical and subtropical flora of America and Asia, several of them more especially American; 10 extend into the tropical regions of the Old World, but not into America; 3 are represented, out of Australia, only in S. America (chiefly extratropical); 4 only in S. Africa; 8 only in New Zealand or through New Zealand in extratropical and Andine S. America, and 39 (of which 18 are still monotypic) are endemic in Australia.

The subdivision into groups of this vast Order has always presented the greatest difficulty and exercised the ingenuity of the most distinguished botanists, there not being one of the characters adopted which does not occasionally break down. Even that of the florets entirely ligulate, which distinguishes the *Cichoraceæ*, hitherto supposed to be absolute, has been invalidated by the *Catanacæ*, recently described by Thompson (Journ. Linn. Soc. ix.), which, although ligulate, appears to be more nearly allied to those genera which connect *Asteroidææ* with *Mutisiaceæ*. Upon the whole, the minute differences in the shape of the style-branches, relied on by Lessing and by De Candolle, notwithstanding numerous exceptions and ambiguities, are, perhaps, the most reliable; and, after a little experience, the difficulties attending their observation diminish considerably. It is always in the style of the hermaphrodite florets that this character must be observed, for in the females it is almost uniform throughout the Order, and due allowance must always be made for occasional exceptions in isolated species or genera. So it is also with another difficult but important character, the anthers with or without tails. These so-called *tails* are in some *Gnaphalieæ* so exceedingly fine and transparent as to be scarcely visible without a strong reflected light on the stage of the mounted lens, whilst in those *Asteroidææ* where they are present they gradually dwindle down to scarcely acute auricles, and in all cases appear to be sometimes wanting in individual species of groups generally characterized by them. With regard to genera, the large ones run into each other so much as to render it a more than usually difficult task to fix their limits, and the number of monotypic or almost monotypic genera published has been most excessive; for the Australian flora alone I have ventured to propose the suppression of more than 80. Too much importance has probably been attached by modern botanists to slight modifications of the pappus in distinguishing these genera, whilst, on the other hand, the involucre may not always have been sufficiently made use of. The shape of the achene is often an excellent character, but very deceptive, for it is rarely ripe in herbarium specimens and the ovary often gives a very incorrect idea of its future shape.

Taking the most important of the tribal characters it will be found that—

The leaves are always alternate in *Cynarocephalæ*, *Vernoniaceæ*, *Senecionideæ*, *Mutisi-*

rea, and Cichoriaceæ, and with few exceptions also in Asteroideæ, Ambrosiææ, Anthemideæ, and Gnaphaliææ; almost always opposite in Eupatoriææ and Meliantheæ. In Gnaphaliææ they are always quite entire, in the other tribes they vary, entire, toothed, lobed, or divided.

The flower-heads are homogamous and discoid in *Cynarocephalæ*, *Vernoniaceæ*, and *Eupatoriaceæ*, homogamous and ligulate in *Cichoriaceæ*, strictly unisexual in *Ambrosiæ*, heterogamous, with the florets of the circumference ligulate or filiform in the other tribes, with exceptionally discoid and homogamous species or genera, rare in *Asteroidæ*, *Anthemideæ*, and *Calendulaceæ*, more frequent in *Gnaphalieæ* and *Senecionideæ*.

The scales of the receptacle are characteristic of *Heliantheae*, and occur only in a few exceptional genera in other tribes.

Tailed anthers characterize with few exceptions the *Cynarocephalæ*, *Gnaphaliææ*, *Calendulaceæ*, and *Mutisiaceæ*, and prevail in a portion of *Asteroidææ*. They never occur in *Eupatoriaceæ*, *Helianthææ*, *Ambrosiææ*, *Anthemideæ*, or *Senecionideæ*, and are very rare in *Vernoniææ*.

The pappus is generally deficient or reduced to a ring or cup in *Anthemideae*, consists of rigid awns or scales, or is wanting in *Heliantheae*, and is most frequently capillary in other tribes, but with so little constancy that it is of very little use in tribal distinctions.

TRIBE I. **Cynarocephalæ**.—*Leaves alternate. Flower-heads discoid, the florets all tubular, hermaphrodite, and regular or nearly so, the lobes usually narrow. Anthers usually fringed or tailed at the base. Style usually slightly thickened at the base of the branches, which are narrow and obtuse or slightly pointed and often erect.*

Pappus none.

Outer involueral bracts with a large leafy appendage, inner ones
with a pungent point. (Flowers orange.) * *CARTHAMUS*.

Involucral bracts ending in a rigid spine with smaller ones at its base. (Flowers purple.) 3. **CENTAUREA.**

Pappus of numerous unequal bristles not much longer than the achene.

Outer involueral bracts ending in small palmate points, intermediate ones in a rigid spine. (Flowers yellow.) 3. CENTAUREA.

Involucral bracts ending in a long lanceolate prickle. Receptacle without bristles. (Flowers purple.) * ONOPORDON.

Pappus of long capillary bristles. Receptacle with bristles between the florets.

Pappus-bristles plumose, in a single row, with or without a few simple ones outside. Involucre not prickly 1. SAUSSUREA.

Pappus-bristles very unequal, the longest or nearly all plumose.

Involucral bracts ending in short scarious jagged appendages. 2. LEUZEA.

Involucral bracts ending in spreading rigid leafy or spinous

appendages * CYNARA.

Pappus-bristles nearly equal, all plumose. Involucres usually prickly * *CIRSIUM*.

Pappus-bristles nearly equal, all simple. Involucres usually prickly * **CARDUUS.**

(27. COLLOCOMA, has almost the habit of *Cynarocephalus*, but with filiform female florets.)

TRIBE II. **Vernoniaceæ**.—*Leaves alternate. Flower-heads discoid, the florets all tubular, hermaphrodite and regular or nearly so. Involucre imbricate. Anthers usually obtuse at the base, without tails. Style branches subulate and acute, not swollen at the base.*

Flower-heads on separate peduncles.

Involucres broad, with a few outer leafy bracts. Pappus of a single row of rigid flattened seed-like bristles. 5. *CENFRATHERUM*.

Involucre ovoid, without leafy bracts. Pappus of capillary bristles with a few or a ring of short ones outside 4. *VERNONIA*.

Involucre ovoid, consisting of few herbaceous bracts. Anthers almost tailed. Pappus of 2 to 4 exceedingly deciduous short bristles 6. PLEUROCARPEA.

(S4. GYNURA, has subulate style-lobes, but involucre bracts in a single row.)

Flower-heads small, sessile, in a cluster or compound head. Involucres narrow, flattened. Pappus of a few rigid bristles. 7. ELEPHANTOTUS.

TRIBE III. **Eupatoriaceæ**.—*Leaves usually opposite. Flower-heads discoid, the florets all tubular, hermaphrodite and regular or nearly so. Anthers obtuse at the base, without tails. Style-branches elongated obtuse and usually club-shaped or thickened at the end.*

Pappus of numerous capillary bristles 8. EUPATORIUM.

Pappus of 5 or 10 chaffy scales or bristles, dilated at the base . . . 9. AGERATUM.

Pappus of 3 to 5 short bristles, each tipped by a gland. 10. ADENOSTEMMA.

TRIBE IV. **Asteroidæ**.—*Leaves alternate or very rarely opposite. Flower-heads either heterogamous or dioecious, the male florets ligulate or filiform, the hermaphrodites or males tubular and 4- or 5-toothed, or (in very few exceptional species) the florets all hermaphrodite and tubular. Anthers various. Style-branches in the hermaphrodite florets usually more or less flattened, produced beyond the stigmatic lines into tips or appendages, papillose on the outside.*

Female florets ligulate, forming a ray to the flower-head.

Pappus of the ray or of all the florets of capillary simple or plumose bristles.

Achenes terete or slightly flattened. Ray-florets in a single row.

Anthers obtuse at the base or shortly pointed. Involucral bracts with dry scarious margins.

Leafy shrubs or undershrubs 11. OLEARIA.

Herb with radical leaves and large heads on simple scapes . . . 12. CELMISIA.

Anthers with fine tails. Involucral bracts dry or the outer ones leaf-like. Ray-florets often irregular 26. PTERIGERON.

Achenes much flattened. Ray-florets numerous, usually in several rows.

Achenes all fertile, produced into a slender beak bearing a capillary pappus 14. PODOCOMA.

Achenes all fertile, not beaked, the capillary pappus sessile.

Style-branches with subulate tips 13. VITTADINIA.

Style-branches with lanceolate or obtuse tips 15. ERIGERON.

Achenes of the ray fertile, with a capillary pappus, those of the disk mostly abortive, with a reduced or scaly pappus . . . 17. MINURIA.

Pappus of rigid unequal usually divaricate awns or spines, sometimes accompanied by scales 18. CALOTIS.

Pappus none or of scales or bristles, much shorter than the achene.

Achenes abruptly contracted at the top into a short neck or boss. Pappus none 19. LAGENOPHORA.

Achenes obtuse or truncate at the top. Pappus short or none . . . 20. BRACHYCOME.

Female florets filiform or irregular.

Flower-heads small, closely sessile, in dense clusters or compound heads.

Involucral bracts linear, herbaceous or scarious.

Pappus none. Anthers without tails or points at the base . . . 21. SPHERANTHUS.

Pappus of capillary bristles. Anthers with short tails or points at the base 22. MONENTELES.

Involucral bracts dry, rigid and acute. Anthers tailed.

Pappus of few rigid bristles, flat and scale-like at the base . . . 28. THESPIDIUM.

Flower-heads separately pedunculate or rarely sessile, but distinct.

Pappus of simple capillary bristles.

Anthers without tails 16. CONYZA.

(A few species of 11. OLEARIA, and 15. ERIGERON, have the ray-florets minutely and imperfectly ligulate.)

Anthers with fine tails.

Involucral bracts narrow-linear, herbaceous or soft. Style of the disk-florets branched 23. BLUMEA.

Involucral bracts rigid, often broad. Some or all the disk-florets sterile, with a simple style 24. PLUCHEA.

Pappus of the female florets none, of the sterile disk-florets small. Anthers and involucre of *Pluchea* 25. EPALTES.

Pappus of scabrous denticulate or almost plumose bristles. Ray-florets usually irregular. Anthers tailed. Involucre dry or leafy 26. PTERIGERON.

Pappus a short scaly jagged tube or cup. Anthers tailed. Involucre dry 27. COLPOCOMA.

Pappus none or of short obtuse scales.

Anthers obtuse at the base. (See VII. ANTHEMIDÆÆ.)

Anthers with fine tails. (See VIII. GNATHALIEÆ.)

(38. NABLONIUM, has the habit of *Calotis*, but no female florets, and the receptacles with scales.)

TRIBE V. **Ambrosiææ**.—*Leaves alternate. Flower-heads absolutely unisexual. Anthers not united.*

Female florets 2 together, consolidated with the involucre into a prickly burr; males numerous, in globular heads, with a very small involucre 29. XANTHIUM.

TRIBE VI. **Meliantheæ**.—*Leaves opposite or rarely alternate. Flower-heads either heterogamous, with the female florets more or less ligulate, the central ones tubular hermaphrodite or male, or rarely discoid, with all the florets hermaphrodite and tubular. Receptacles with chuffy scales between the florets. Anthers without tails. Style of the Senecionidææ or approaching that of Asteroidææ. Pappus of stiff awns or of short scales or none.*

Involucre of 2 rows of bracts, the outer narrow leafy and glandular, the inner ones and the receptacle scales enveloping the florets.

Pappus none 30. SIEGESBECKIA.

Involucre of 2 or 3 rows of bracts, nearly equal or the outer row broader and leafy.

Pappus none or of very short awns or fine bristles.

Receptacle flat or slightly convex.

Style-branches obtuse and flattened. Ray-achenes triangular; disk-achenes flat 31. ECLIPTA.

Style-branches almost acute. Ray- and disk-achenes usually flattened or thick 32. WEDELIA.

Style of the disk-florets undivided. Ray-achenes flattened; disk-achenes abortive 33. MOONIA.

Receptacle conical. Style-branches truncate. Ray-achenes triangular; disk-achenes flattened 34. SPILANTHES.

Pappus of oblong chuffy scales. Receptacle conical 35. GALINSOGA.

Pappus of 2 to 4 rigid awns.

Style-branches with acute or subulate points.

Ray-florets, when present, neuter 36. BIDENS.

Ray-florets, when present, female 37. GLOSSOGYNE.

Style-branches truncate. Small creeping herb, with 1-headed scapes 38. NABLONIUM.

Involucre of a single row of bracts, united in a toothed cup. Pappus of unequal scales or awns 39. TAGETES.

Involucre of 4 broad leafy bracts, 2 outer larger than the 2 inner.

Ray-florets in several rows, with very small ligules. No pappus . 40. ENHYDRA.

Flower-heads small, narrow, collected in dense clusters or compound heads. No pappus 41. FLAVERIA.

TRIBE VII. **Anthemideæ**.—*Leaves alternate. Flower-heads heterogamous, the females ligulate or filiform or without corollas, the disk-florets hermaphrodite or male, or very rarely all the florets tubular and hermaphrodite. Receptacle without or rarely with scales. Anthers without tails. Style of Senecionidæ. Pappus none or reduced to a raised border or rarely of short scales.*

Florets of the circumference distinctly ligulate.

Receptacle very conical, with a few scales between the florets . . . * ANTHEMIS.

Receptacle flat or convex, without scales . . . * CHRYSANTHEMUM.

Florets of the circumference tubular or obscurely ligulate, or without corollas. Disk-achenes often abortive. Small annuals or rarely perennials.

Female florets without any or with a very short, broad, or conical corolla.

Achenes flattened, obtuse or truncate. Flower-heads pedunculate . . . 42. COTULA.

Achenes flattened, crowned by the hardened style, or by 2 prominent divaricate angles. Flower-heads sessile . . . 43. SOLIVA.

Female florets shortly tubular. Achenes 3- or 4-angled. Flower-heads sessile or nearly so . . . 44. MYRIOGYNE.

Female florets slender.

Achenes 4-angled or flattened. Pappus none.

Style-lobes long and slender. Leaves radical, spreading. Scapes leafless . . . 19. LAGENOPHORA.

Style-lobes short, truncate. Leaves crowded, in dense tufts or on very short creeping stems. Flower-heads sessile or shortly pedunculate . . . 45. ABROTANELLA.

Achenes large, flat, with herbaceous involute wings. Pappus none. Flower-heads nearly sessile . . . 46. CERATOGYNE.

Achenes not flattened. Pappus of lanceolate or oblong scales. Flower-heads terminal. Pappus-scales lanceolate . . . 47. ELACHANTHUS.

Flower-heads clustered within the radical leaves. Pappus-scales oblong . . . 48. ISOETOPSIS.

TRIBE VIII. **Gnaphalieæ**.—*Leaves alternate, quite entire. Flower-heads discoid, with all the florets tubular and hermaphrodite or the central ones male, or the florets of the circumference female and filiform or very rarely ligulate or irregular, or rarely the heads more or less divaricous. Anthers with very fine hair-like tails at the base, sometimes very short (or rarely quite wanting?). Style-branches usually nearly terete, very obtuse or truncate. Involucral bracts most frequently scarious.*

SUBTRIBE I. **Angianthereæ**.—*Flower-heads small, usually numerous, sessile or nearly so on a common receptacle, in a dense cluster or compound head, usually surrounded by scarious or leafy bracts, forming a general involucre. Florets all hermaphrodite, a few rarely sterile.*

Receptacles (within the partial heads) without scales between the florets.

General involucre of numerous bracts, in several rows, usually with scarious tips or small radiating laminae. General receptacle broad and flat.

Pappus none or various . . . 49. MYRIOCEPHALUS.

General involucre none or of few short scarious bracts, with or without a few leafy bracts or floral leaves outside.

Pappus none or of 1 or more awned or jagged scales.

Involucres flattened, with 1 outer flat and 2, rarely 3 lateral

- conduplicate or concave scarious bracts, with or without
 1 or 2 inner flat ones. 50. **ANGIANTHUS**.
 Involucres of several bracts, the inner ones broader than the
 outer ones, and very deciduous. 51. **GNEPHOSIS**.
 (See also 62. **ERIOCHLAMYS**, in which the heads are some-
 times clustered.)
 Pappus of several bristles or scales, plumose-ciliate or with
 terminal plumose tufts. General receptacle small or
 branched, and the partial heads often rather distinct.
 Floral leaves none or few, and shorter than the heads.
 Involucral bracts about as long as the florets, without any
 or with very short and broad radiating tips. Pappus-
 bristles usually more than 6 52. **CALOCEPHALUS**.
 Inner involucral bracts with long, petal-like, radiating
 laminae. Pappus-bristles 3 to 6 53. **CEPHALIPTERUM**.
 Floral leaves several, as long as or longer than the clusters.
 Pappus-bristles 5, very elastic. Small annuals 54. **GNAPHALODES**.
 Receptacles (within the partial heads) with scales between the florets.
 Pappus of several plumose-ciliate bristles or scales. Stems or
 peduncles elongated and erect. 55. **CRASPEDIA**.
 Pappus none or of very short scales. Dwarf, diffuse or stemless
 annuals 56. **CHTHONOCEPHALUS**.
 SUBTRIBE II. **Helichryseæ**.—*Flower-heads distinct, pedunculate or sessile. Female*
filiform florets few or none, rarely forming 1 or 2 complete outer series.
 Receptacle with scales between the florets.
 Pappus none. Receptacle-scales enveloping the florets 57. **IXODIA**.
 Pappus a scarious cup. Receptacle-scales broad, flat or concave. 58. **AMMOBIUM**.
 Pappus of distinct capillary bristles. Receptacle-scales narrow,
 flat or concave 59. **CASSINIA**.
 Receptacle without scales.
 Pappus none.
 Involucre small, narrow, of scarious or petal-like bracts, not
 radiating. Flower-heads paniculate or corymbose 60. **HUMEA**.
 Involucre turbinate, the outer bracts small, imbricate, the inner
 petal-like, radiating. Flower-heads on long peduncles 61. **PITHOCARPA**.
 Involucre globular, enveloped in dense wool, the inner bracts
 scarious, not radiating. Receptacle conical. Small annual,
 the heads often clustered 62. **ERIOCHLAMYS**.
 Involucre broadly hemispherical, with scarious bracts, not ra-
 diating. Flower-heads on long peduncles 63. **ACOMIS**.
 Involucre of few linear herbaceous nearly equal bracts. Corolla
 slender, recurved. Dwarf annuals 64. **TOXANTHUS**.
 Pappus a small greenish glandular cup. Involucre of few, narrow,
 nearly equal, herbaceous bracts. Dwarf annual 65. **SCYPHOCORONIS**.
 Pappus of chaffy scales.
 Involucre hemispherical. Bracts scarious. Pappus-scales ob-
 tuse or jagged, or divided into bristle-like branches 66. **RUTIDOSIS**.
 Involucre cylindrical, the bracts scarcely scarious. Pappus-
 scales produced into long fine awns. Dwarf annual 67. **QUINETIA**.
 Pappus of capillary bristles, simple, barbellate or plumose.
 Involucral bracts linear, all herbaceous or the inner ones shortly
 scarious at the tips.
 Achenes contracted into a slender beak. Involucral bracts
 nearly equal 68. **MILLOTIA**.
 Achenes not beaked. Involucres imbricate.
 Florets all hermaphrodite. Inner involucral bracts with
 short scarious or radiating tips. Pappus simple 69. **IXIOLENA**.

- Outer florets female, ligulate, irregular or filiform. Involucral bracts subulate-acuminate. Pappus strongly barbellate or plumose 70. *ATHRIXIA*.
- Involucral bracts green, almost leaf-like or thin, but not scarious. Pappus plumose. Achenes shortly stipitate . . . 71. *PODOTHECA*.
- Involucral bracts imbricate, scarious or with petal-like laminæ. Achenes sessile.
- Pappus of simple or shortly barbellate bristles, rarely (in sect. *Chrysocephalum* of *Helichrysium*) with a plumose tuft at the end.
- Involucral bracts all very thin and scarious. Outer female florets usually large and irregular 72. *PODOLEPIS*.
- Outer involucral bracts thin and scarious. Achenes more or less distinctly contracted into a beak 73. *LEPTORHYNCHUS*.
- Involucral bracts almost all or the inner ones or their laminæ opaquely scarious or petal-like. Achenes not beaked. Female florets usually few (except in sect. *Chrysocephalum*). Stems erect, leafy, simple or branched.
- Outer achenes broad and flat, all the others abortive . . . 74. *SCHENIA*.
- Achenes angular or compressed, but not very flat, all perfect, or only few abortive in the centre 75. *HELICHRYSUM*.
- Involucres more or less scarious, usually elastically spreading after flowering. Female florets usually numerous. Dwarf tufted or shortly diffuse mountain perennials, with solitary, sessile or shortly pedunculate flower-heads 78. *RAOULIA*.
- Pappus plumose from the base, except in some *Waitzia*.
- Involucral bracts scarious or petal-like, or with petal-like laminæ. Achenes sessile.
- Achenes with slender beaks 76. *WAITZIA*.
- Achenes not beaked 77. *HELIPTERUM*.
- Involucral bracts more or less green, herbaceous or thin, but not scarious. Achenes stipitate 71. *PODOTHECA*.

SUBTRIBE III. *Eugnaphalieæ*. *Flower-heads distinct or in dense clusters or compound heads, usually small. Female filiform florets numerous, in several rows or in separate heads.*

Pappus of capillary bristles.

Female florets in one or two rows. Dwarf tufted or shortly diffuse mountain perennials, with solitary, sessile or shortly pedunculate flower-heads 78. *RAOULIA*.

Flower-heads strictly dioecious 79. *ANTENNARIA*.

Flower-heads more or less androgynous, usually small and clustered, rarely solitary. Female florets in several rows 80. *GNAPHALIUM*.

Pappus of 6 serrulate, thick or broad bristles or scales. Habit of

Raoulia 81. *PTERYGOPAPPUS*.

Pappus none 82. *STUARTINA*.

(47. *ELACHIANTHUS*, with a scaly pappus, and 46. *CERATOGYNE*, and 48. *ISOETOPSIS*, without pappus, have the entire leaves and numerous female florets of *Gnaphalieæ*, but short anthers without tails, and the female florets wider at the base.)

TRIBE IX.—*Senecionidæ*. *Leaves alternate. Flower-heads either heterogamous, with the female florets ligulate or rarely filiform, or sometimes homogamous, with all the florets hermaphrodite and tubular. Receptacle without scales. Anthers obtuse or scarcely pointed at the base, without tails. Style-branches truncate and penicillate, or rarely with pubescent tips or appendages. Pappus of capillary bristles. Involucral bracts in the Australian genera in a single row, with or without a few small outer ones round their base*

- Outer female florets filiform, usually in 2 or 3 rows 83. *ERECTHITES*.
 Florets all tubular and hermaphrodite, or the outer ones ligulate.
 Style-branches with subulate tips 84. *GYNURA*.
 Style-branches truncate.
 Inflorescence terminal. Indumentum cottony or simple . . . 85. *SENECIO*.
 Inflorescence axillary. Indumentum stellate 86. *BEDFORDIA*.

TRIBE X. *Calendulaceæ*.—*Leaves alternate. Flower-heads usually heterogamous, the ray-florets ligulate, female or rarely neuter, the disk-florets tubular, hermaphrodite, but sterile or rarely fertile, and very rarely the heads homogamous and discoid. Anthers usually sagittate, but scarcely tailed. Style-branches in the disk-florets more or less concrete, and thickened at the base.*

- Disk-achenes usually perfect. Leaves radical or nearly so, pinnatifid,
 white underneath. Rays long, spreading.
 Achenes glabrous. Pappus none 87. *CYMBNOTUS*.
 Achenes densely woolly. Pappus of short scales concealed in the
 wool. 88. *CRYPTOSTEMMA*.
 Disk-achenes all abortive. Stems leafy. Leaves undivided. Pappus
 none.
 Rays very small. Achenes with 3 broad scarious wings . . . * *TRIPTERIS*.
 Rays rather long, spreading. Achenes much incurved, mucate
 on the back, the margins sometimes dilated but not winged. . . * *CALENDULA*.

TRIBE XI. *Mutisiaceæ*.—*Leaves alternate. Flower-heads either heterogamous, with radiating female florets, or homogamous, with the florets all tubular and hermaphrodite, some or all of the outer florets in all cases more or less 2-tipped. Anthers pointed or tailed at the base. Style varying from that of Calendaceæ to nearly that of Senecionidæ.*

- Flower-heads radiate. Achenes villous, with a pappus of capillary
 bristles. Radical leaves, scape, and large flower-heads nearly
 of *Celmisia* 89. *AMBLYSPERMA*.

TRIBE XII. *Cichoriaceæ*.—*Leaves alternate. Flower-heads homogamous, with all the florets ligulate.*

- Pappus none or very minute.
 Stem rigid, branching, leafy. Florets large, blue * *CICHORIUM*.
 Leaves radical. Scares leafless, simple or branched. Florets
 small, yellow * *ARNOSERIS*.
 Pappus of narrow flat scales tapering into simple or plumose bristles 90. *MICROSERIS*.
 Pappus, at least of the central achenes, of plumose capillary bristles.
 Receptacle with a few chaffy scales between the florets. Achenes
 mostly beaked 91. *HYPOCHÆRIS*.
 Receptacle without scales.
 Achenes tapering into a slender beak. Involucral bracts long,
 nearly equal * *TRAGOPOGON*.
 Achenes very shortly contracted at the top. Involucre with
 small outer bracts.
 Stems leafy, hispid. Outer involucral bracts numerous . . . 92. *PICRIS*.
 Leaves radical. Stems leafless or nearly so. Outer involu-
 cral bracts few and small * *LEONTODON*.
 Pappus of numerous simple capillary bristles or hairs.
 Achenes not at all or scarcely flattened.
 Stems leafy. Achenes very shortly contracted at the top . . . 93. *CREPIS*.
 Leaves radical. Scares leafless. Achenes contracted into a
 long slender beak * *TARAXACUM*.
 Achenes very flat. Stems leafy.
 Achenes not beaked 94. *SONCHUS*.
 Achenes contracted into a slender beak * *LACTUCA*.

TRIBE I. CYNAROCEPHALÆ.—Leaves alternate, often prickly. Flower-heads discoid, the florets all tubular, hermaphrodite and equal or nearly so, the lobes usually narrow. Receptacle bristly or rarely naked. Anthers usually fringed or tailed at the base. Style usually slightly swollen at the base of the branches, which are narrow and obtuse or slightly pointed, and often erect or cohering nearly to the end.

This tribe comprises a great majority of the plants popularly known in Europe under the name of *Thistles*. The two species indigenous to Australia are, however, not prickly. The involucre is usually ovoid or globular, hard, with numerous imbricated scales, unlike that of almost any other *Compositæ* except tropical *Vernoniaceæ*, readily known by their style; *Coleocoma* and a few allied plants distinguished by their slender female florets; and a few tropical *Labiatifloræ*. The *Calendulaceæ*, united by some with *Cynarocephalæ* under the name of *Cynaceæ* on account of their style, differ widely in their habit and involucre, and generally in their heterogamous radiate flower-heads, and appear to me to be much better placed between the *Senecionidæ* and the *Labiatifloræ*.

1. SAUSSUREA, DC.

(*Apotaxis*, DC.)

Involucre ovoid or campanulate, not longer than the florets, the bracts numerous, imbricate, not prickly, the inner ones the longest. Receptacle bearing bristles between the florets. Florets all tubular, regular, with 5 narrow lobes. Anthers tailed. Style-branches linear, slightly thickened at the base. Achenes glabrous. Pappus of several plumose bristles united in a ring at the base, with a few outer simple or short bristles or scales, sometimes on one side only or very small, rarely wholly wanting.—Erect herbs. Leaves toothed or lobed or pinnately divided. Flower-heads rather large and solitary, or smaller and paniculate. Florets purplish.

A considerable genus, spread over the hilly regions of the northern hemisphere, chiefly in the Old World. The only Australian species is also in India and China.

1. *S. carthamoides*, Benth. *Fl. Hongk.* 168. An annual, with a rigid erect branching stem of 1 to 2 ft. or sometimes more, sulcate and slightly cottony. Leaves deeply pinnatifid or lyrate, the lower lobes narrow, the terminal one broad, thin, green above, white and cottony underneath, 3 or 4 in. long; the lower leaves sometimes ovate and nearly entire on long petioles, the uppermost few, with narrow lobes. Flower-heads few, on long peduncles. Involucre campanulate, 6 to 8 lines diameter, the numerous bracts linear-lanceolate, often very pointed but not pungent. Achenes striate, slightly curved. Outer pappus usually of several very short scales or bristles united in a minute oblique ring but very variable in size and number, sometimes very deciduous, leaving only the minute oblique ring, or very small from the first or entirely wanting.—*Serratula carthamoides*, Roxb. *Fl. Ind.* iii. 407; *Apotaxis carthamoides*, Ham. in DC. *Prod.* vi. 540; *A. multicaulis*, DC. l. c. and in Deless. *Ic. Pl.* iv. t. 68; *A. foliosa*, Edgew. in *Trans. Linn. Soc.* xx. 77; *Haplotaxis australasica*, F. Muell. *Fragm.* i. 36.

Queensland, Bowman; Dawson and Burnett rivers, F. Mueller; Keppel Bay, Thozet.

N. S. Wales. Hunter's River, R. Brown; Clarence river, Beckler.

The species is common throughout India, extending to China and Japan. *A. candicans*, DC. *Prod.* vi. 540, may be a large form of it with less divided leaves, and larger more hoary involucre.

2. **LEUZEA**, DC.

Involucre ovoid or globular, the bracts imbricate, numerous, not prickly, with broad rigidly scarious jagged tips. Receptacle flat, densely bristly between the florets. Florets all tubular, slender, 5-lobed. Anthers with short tails. Style-branches cohering or shortly spreading at the tips. Achenes oblong, compressed, glabrous. Pappus of numerous unequal fine bristles in several rows, all shortly plumose.—Erect herbs. Leaves toothed or pinnately divided. Flower-heads large, solitary, terminal. Florets purplish.

A small genus, confined to the temperate regions of the northern hemisphere in the Old World, with the exception of the single Australian species, which is endemic.

1. **L. australis**, *Gaudich. in Freyc. Voy.* 462. t. 92. A rigid erect herb, probably biennial, attaining 2 ft. or rather more, simple or scarcely branched, with a little loose cottony wool. Leaves petiolate, oblong-lanceolate, either toothed only, or more or less deeply pinnatifid or pinnately divided, the lower ones 6 in. long or more on long petioles, the upper ones few, small, and nearly sessile. Flower-heads solitary on a long terminal peduncle. Involucre ovoid, and $1\frac{1}{2}$ to 2 in. long when in flower, more globular when in fruit, the outer bracts short, with a nearly orbicular appendage, the inner ones gradually longer, the innermost as long as the florets, tapering into narrow-linear tips with scarcely any scarious appendage. Style-branches often remaining united to the end. Achenes smooth, slightly striate, crowned by a slightly projecting border under the pappus.—DC. Prod. vi. 665.

Queensland, *Bowman*; Condamine river, Leydley's Creek, and head of the Gwydir, *Leichhardt*; Dawson river, *F. Mueller*.

N. S. Wales. Sandy shore near Kingsdown, *R. Brown*; Fish River, *Gaudichaud*; New England, *C. Stuart*.

Victoria. Rocky grassy declivities, Murrumbidgee river and Lake Omeo, *F. Mueller*.

With all the habit and characters of the genus, this is the only species native of the southern hemisphere. Amongst northern species it is the most nearly related to the Spanish *L. rhaponticoides*, Gracils.

 3. **CENTAUREA**, Linn.

Involucre globular or ovoid, the bracts imbricate, numerous, ending either in a prickle or in a fringed or toothed appendage. Receptacle bearing numerous bristles between the florets. Florets all tubular and 5-lobed, the outer row often larger and neuter. Anthers tufted. Style-branches linear, often cohering, thickened at the base. Achenes glabrous, usually obliquely or laterally attached at the base. Pappus short, of simple bristles or scales, sometimes very short, or rarely wholly wanting.—Erect or prostrate herbs, usually rigid. Leaves alternate, entire or pinnatifid, rarely prickly. Flower-heads large and solitary, or smaller and paniculate. Florets purple-blue or yellow.

The species are very numerous in the Mediterranean and Caucasian regions of the northern hemisphere, with a very few American species, and some of the common ones spread with civilization over various parts of the globe. Among these must be included those now found in Australia, of which *C. melitensis* alone has at first sight been taken for an indigenous plant.

1. *C. melitensis*, Linn.; DC. Prod. vi. 593. An erect rigid annual of 1 to 2 ft., with a little white cottony wool, or nearly glabrous. Radical leaves pinnately divided; stem-leaves narrow, decurrent, entire or slightly toothed. Flower-heads terminal, sessile above the last leaves, solitary or 2 or 3 in a cluster. Involucre above $\frac{1}{2}$ in. long, the bracts rigid, the appendage of the outer ones small with short palmate spines, of the intermediate ones consisting of a rigid spine spreading to from 2 to 4 lines, with short divaricate spines at the base, the inner ones tapering into a very short simple spine. Florets yellow. Pappus of several series of bristles, the outer ones short, the intermediate gradually longer, the innermost row very short.—*C. apula*, Lam.; DC. l.c.

A native of the Mediterranean region, now spread over cultivated and waste places in many of the warmer regions both of the New and the Old World, especially near the sea, and very abundant in various parts of **Queensland, N. S. Wales, Victoria, Tasmania, and S. Australia.**

The following European species of this genus, and of other genera of *Cynarocephalæ*, have also been sent from Australia as introduced weeds:—

C. solstitialis, Linn.; DC. Prod. vi. 594. An annual, with the habit, foliage, and yellow florets of *C. melitensis*, but with a much longer and stouter spine to the intermediate involueral bracts, whilst the inner ones have a jagged scarious appendage without any spine.—*S. Australia, Herb. F. Mueller.*

C. calcitrapa, Linn.; DC. Prod. vi. 597. A coarse annual, green or slightly covered with cottony down, seldom rising to a foot in height, but with very spreading or prostrate branches. Leaves pinnatifid, with a few long linear or lanceolate lobes. Flower-heads sessile in the forks or within the last leaves of the branches. Involueral bracts, at least the intermediate ones, ending in stiff spreading spines of $\frac{1}{2}$ to 1 in., with 1 or 2 small ones at their base. Florets purple. Achenes without any pappus.—*Tasmania, Herb. F. Mueller.*

Carthamus tinctorius, Linn.; DC. Prod. vi. 612. An erect rigid glabrous herb of 1 to 2 ft., with alternate ovate leaves, stem-clasping at the base, and bordered by a few small prickly teeth. Flower-heads terminal. Involucres globular, of closely imbricate rigid bracts, the outer ones terminating in leafy appendages like the stem-leaves, but smaller, the inner ones in a rigid pungent point, the florets all tubular, of a rich orange. Receptacle with linear bristle-like scales. Achenes glabrous, without any pappus.—Near Adelaide, in the neighbourhood of gardens.

Onopordon acanthium, Linn.; DC. Prod. vi. 618 (*Scotch Thistle*). A tall stout Thistle, covered with a loose cottony wool. Leaves coarsely toothed or pinnatifid, waved and very prickly, their broadly-decurrent margins forming prickly wings all down the stems. Flower-heads large, erect, and solitary at the ends of the branches. Involucres globular, of numerous bracts, ending in a long lanceolate prickle. Florets all tubular. Receptacle pitted with raised jagged edges shorter than the achenes. Achenes glabrous. Pappus of serrulate bristles, not plumose, and rather longer than the achenes.—*Victoria and South Australia.*

Carduus marianus, Linn. (*Silybum marianum*, Gaertn.; DC. Prod. vi. 616.) An erect Thistle of 1 or 2 ft., glabrous or with very little cottony wool. Leaves smooth and shining, variegated with white veins, the lower ones deeply pinnatifid and very prickly, the upper ones clasping the stem by prickly auricles scarcely decurrent. Flower-heads large, drooping, solitary and terminal. Involucre globular, the bracts imbricated with a very broad base, and a stiff spreading leafy appendage ending in a long prickle, bordered with prickles at its base. Receptacle with bristles between the florets. Achenes glabrous. Pappus of simple hairs.—*About Melbourne, Adamson.*

Cirsium lanceolatum, Scop.; DC. Prod. vi. 636. A rather stout Thistle, attaining 3 or 4 ft. Leaves waved, pinnatifid and very prickly, rough on the upper side, white and cottony underneath, decurrent into prickly wings along the stem. Flower-heads not numerous, rather large. Involucres ovoid, above an inch long, the bracts lanceolate, ending in a stiff prickle. Florets purple, all tubular. Receptacle with bristles between the florets. Achenes glabrous. Pappus of plumose bristles.—*Victoria and Tasmania.*—*C. palustre*, Scop.; DC. Prod. vi. 643. A tall Thistle, with the stems quite covered with the prickly decur-

rent margins of the leaves. Leaves pinnatifid and very prickly. Flower-heads rather numerous, small, and ovoid, usually collected in clusters. Involueral bracts numerous, with small somewhat prickly points. Florets, achenes, and pappus of *C. lanceolatum*.—Tasmania. —*C. arvense*, Scop.; DC. Prod. vi. 643. A rather tall Thistle with a creeping rhizome. Leaves pinnatifid, very prickly, clasping the stem with prickly angles, or shortly decurrent. Flower-heads not large, in loose corymbs, disciform. Involueral bracts numerous, with very small prickly points. Florets, achenes, and pappus of *C. lanceolatum*.—Tasmania.

Cynara cardunculus, Linn.; DC. Prod. vi. 620, var. *Scolymus* (*C. Scolymus*, Linn.; DC. l. c. the *Artichoke*). A tall stout Thistle, the stems and underside of the leaves with more or less of a white cottony wool. Leaves large, deeply pinnatifid, with narrow spinous lobes or teeth. Flower-heads very large, the bracts much imbricated and fleshy at the base, the hard herbaceous tips spreading, prickly-pointed in the typical wild *Carduus*, almost obtuse or notched in the cultivated *Artichoke*. Receptacle very fleshy, with bristles between the florets. Florets all tubular, purple. Achenes glabrous. Pappus of numerous very unequal bristles, the longer ones or nearly all plumose.—Near Adelaide.

TRIBE II. VERNONIACEÆ. Leaves alternate. Flower-heads discoid, the florets all tubular, hermaphrodite and regular or nearly so. Involucre imbricate. Anthers usually obtuse at the base, without tails. Style-branches subulate and acute, not swollen at the base.

The subulate style-branches appear to be constant in the tribe. They occur also exceptionally in a few genera of *Asteroidæ*, *Gnaphaliæ*, or *Senecionidæ*, which are, however, readily to be distinguished either by their heterogamous flower-heads, or by their involucre. The exceptional anthers of *Pleurocarpæa* occur also in the small group of Mascarene *Vernoniaceæ*, distinguished by De Candolle under the name of *Bojeriæ*.

4. VERNONIA, Schreb.

Involucre ovoid-globular or hemispherical, the bracts imbricate, not longer than the florets, the inner bracts the longest. Receptacle without scales. Florets all tubular and equal, regular, with 5 narrow lobes. Anthers obtuse at the base. Style-lobes subulate. Achenes mostly striate or angular, rarely cylindrical. Pappus of numerous capillary bristles, usually surrounded by an outer row of very short often chaff-like bristles, which are rarely entirely wanting.—Herbs, or in species not Australian, shrubs or climbers. Leaves alternate. Flower-heads terminal or in the upper axils, in cymes or panicles or sometimes solitary. Florets usually purple.

A very numerous genus, widely spread over the warmer regions of the globe, but most abundant in America, where it extends beyond the tropics both to the northward and southward. In Australia it is represented by a single species, a weed of tropical Asia, differing slightly from the great mass of the genus in its habit, which is nearly that of a *Conyza*.

1. *V. cinerea*, Less.; DC. Prod. v. 24. Annual or forming a perennial rootstock, erect, 1 to 2 feet high, nearly glabrous, scabrous-pubescent, hirsute, hoary-tomentose or woolly. Lower leaves petiolate, ovate-oblong or lanceolate, often irregularly toothed or sinuate, the upper ones few and narrow, or occasionally nearly all ovate or nearly all narrow. Flower-heads small, on slender peduncles, forming a terminal leafless cymose panicle. Involueral bracts very acute. Achenes cylindrical, scarcely striate, hairy. Pappus white, the outer row very short, and sometimes reduced to very few bristles.—*V. erigeroides*, DC. Prod. v. 25; *V. cynapioides*, Walp. in Linnaea, xiv. 509, and probably nearly the whole of the section *Tephrodes*, DC.

N. Australia. Victoria river and Macadam range, *F. Mueller*.

Queensland. Port Curtis, *McGillivray*; Rockingham Bay, Port Denison, Rockhampton, *Dallachy*; Brisbane river, Moreton Bay, and Peak Downs, *F. Mueller*; Keppel Bay, *Thozet*.

N. S. Wales. Port Jackson to the Blue Mountains, *Woolfs* and others; northward to Clarence and Hastings rivers, *Beckler*; New England, *C. Stuart*; southward to Twofold Bay, *Mossman*.

There are two principal varieties in Australia, one either nearly glabrous or rarely hirsute, with short rigid hairs, the other very hoary-tomentose or woolly, with softer more obtuse leaves, and usually smaller flower-heads, the corolla lobes also appear shorter. The flowers very purple or white, but almost always purple in the more glabrous form.

5. CENTRATHERUM, Cass.

Involucre imbricate, a few of the outer bracts long and leaf-like, the others not longer than the florets, the inner ones the longest. Receptacle naked. Florets all tubular and equal, regular, with 5 narrow lobes. Anthers obtuse at the base; style-lobes subulate. Achenes oblong, nearly cylindrical, striate. Pappus of a single series of rigid, flattened, hirsute, very deciduous, almost chaff-like bristles.—Herbs or shrubs. Leaves alternate. Flower-heads on terminal or leaf-opposed peduncles. Involucres hemispherical. Florets usually purple.

A small American genus, of which two species, including the Australian one, have spread over several of the warmer regions of the Old World.

1. **C. muticum**, *Less.*; *DC. Prod.* v. 70. A rigid divaricately-branched herb, probably annual, although with a hard almost woody base, spreading to 2 or 3 ft., glabrous or pubescent. Leaves petiolate, lanceolate-oblong or almost ovate, 1 to 2 in. long, coarsely and irregularly toothed. Flower-heads often above $\frac{1}{2}$ in. diameter, the outer leafy bracts $\frac{1}{2}$ to 1 in. long, the inner ones numerous, with spreading more or less coloured or scarious denticulate tips. Florets purple, much longer than the involucre. Achenes usually glabrous, with about 10 very obtuse ribs, the pappus falling off even before they are ripe.

Queensland. Brisbane river, Moreton Bay, *F. Mueller*; Rockhampton, *Dallachy*.

N. S. Wales. Hawkesbury river, *R. Brown*; Clarence river, *Beckler*, *Wilcox*; Blue Mountains; *Miss Atkinson*.

The species is common in tropical America; we have also apparently the same from the Philippine Islands.

6. PLEUROCARPÆA, Benth.

Involucre ovoid, the bracts few, herbaceous, imbricate, not so long as the florets. Receptacle without scales. Florets all tubular and equal, regular, often incurved, with 5 narrow lobes. Anthers sagittate at the base, the antheries produced into short not fine points. Achenes thick, with prominent ribs. Pappus of 2 to 5 rigid short exceedingly deciduous bristles. Leaves alternate, entire or toothed. Flower-heads on terminal peduncles.

The genus is limited to a single species endemic in Australia, not nearly allied to any one known to me, unless it be to some anomalous species of *Decaneurum*.

1. **P. denticulata**, *Benth.* Herbaceous, with hard divaricate or decum-



bent branches, our specimens above 1 ft. long, and quite glabrous. Leaves ovate or oval-elliptical, mucronate-acute, contracted into a very short petiole, the larger ones above 2 in. long, irregularly bordered by acute teeth, the upper ones smaller and entire. Peduncles terminal, solitary or 2 together, 1 to 2 in. long or longer after flowering, slightly thickened under the head. Involucre about 4 lines long, thickened at the base, the bracts broadly lanceolate, acuminate. Florets about 10 to 20, of a bluish-purple, the tube exceeding the involucre, often incurved, shortly dilated into a deeply 5-lobed limb.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*, who had given it the provisional name of *Lipthure denticulata*, but he afterwards published as *Lepetriea* a very different African plant.

7. ELEPHANTOPUS, Linn.

Flower-heads of 2 to 5 florets, collected together in compound heads. Involucres compressed, of about 8 bracts, dry, stiff, alternately plane and conduplicate. Receptacle naked. Florets with 4 narrow equal lobes, but deeper cleft on one side, so as to be somewhat palmate. Anthers obtuse at the base. Style-lobes subulate. Pappus of a few stiff bristles, somewhat dilated at the base.—Stiff herbs, usually grey with appressed often silky hairs. Leaves alternate.

A genus of about a dozen American species, one of which is also spread over tropical Africa and Asia as well as Australia.

1. **E. scaber**, Linn.: *DC. Prod.* v. 86. Stock perennial. Stems stiff, erect, about a foot high, with a few forked spreading branches, more or less covered, as well as the leaves and involucres, with greyish hairs. Radical leaves 2 to 4 in. long, obovate-oblong, more or less crenate, and usually narrowed into a petiole. Stem leaves few and more sessile. Flower-heads closely clustered into terminal hemispherical compound heads, of nearly 1 in. diameter, surrounded by about 4 broadly cordate sessile leafy bracts. Involuceral bracts narrow, very pointed, almost prickly.—Wight, *lc.* t. 1086; Benth, *Fl. Hongk.* 170, with the synonyms adduced.

N. Australia. Port Essington, *Armstrong*. Common in the warmer regions of America, Africa, and Asia.

Queensland. Endeavour river, *Banks and Solander*.

TRIBE IV. EUPATORIACEÆ.—Leaves usually opposite. Flower-heads discoid, the florets all tubular, hermaphrodite, and regular or nearly so. Anthers obtuse at the base, without tails. Style-branches elongated, obtuse and usually club-shaped or thickened at the end.

This tribe is scarcely Australian, the following three species, perhaps all introduced, are readily distinguished from all other tribes by their opposite leaves and club-shaped styles.

8. EUPATORIUM, Linn.

Involucre hemispherical, campanulate or cylindrical, the bracts imbricate, in 2 or more series. Receptacle flat or slightly convex, without scales.

Florets numerous or few, all tubular, hermaphrodite, 5-toothed. Anthers obtuse at the base. Style-branches elongated, obtuse. Achenes 5-angled, without intermediate strie. Pappus of a single series of capillary bristles. — Perennial herbs or shrubs or very rarely annuals. Leaves usually opposite. Flower-heads mostly corymbose. Green parts of the plant often sprinkled with resinous dots.

A vast genus, the great majority of species being American, a few ranging over eastern Asia, and one extending to Europe, and now introduced into Australia.

*1. ***E. cannabinum***, *Linn.*; *DC. Prod.* v. 180. A perennial with erect stems of 3 to 4 ft., slightly pubescent. Leaves divided to the base into 3 broadly lanceolate coarsely-toothed segments, often 4 or 5 in. long, those of the upper leaves smaller and sometimes very narrow, the uppermost leaves rarely undivided. Flower-heads numerous in compact terminal heads. Involucres cylindrical, of few unequal bracts, the inner ones often coloured. Florets usually 5, purple or rarely white.—*E. Lindleyanum*, F. Muell. *Fragm.* v. 62, not of *DC.*

Very common in the temperate regions of the northern hemisphere in the Old World; it appears to have established itself on the Tweed river in **N. S. Wales**. *C. Stuart.*

9. **AGERATUM**, *Linn.*

Involucre florets and style of *Eupatorium*. Achenes angular. Pappus of 5 or 10 chaffy scales or bristles, dilated at the base.—Herbs with the opposite leaves and habit of *Eupatorium*.

A genus of a small number of American species, one of which is spread all over the warmer regions of the globe.

1. ***A. conyzoides***, *Linn.*; *DC. Prod.* v. 108. An erect branching annual, 1 to 2 ft. high, more or less hirsute with spreading hairs. Leaves opposite, petiolate, ovate, crenate. Flower-heads rather small, in dense terminal corymbs. Involucral bracts striate, acute, in about 2 rows. Florets numerous, pale blue or white. Achenes black. Pappus of 3 lanceolate awned chaffy scales, often serrate in the lower part.—*Hook. Exot. Fl.* t. 15; F. Muell. *Fragm.* v. 62.

Queensland. Rockhampton, *Dallachy*. A common weed all over the warmer regions of the globe.

10. **ADENOSTEMMA**, *Forst.*

Flower-heads, florets, and style of *Eupatorium*. Achenes obovate-oblong, contracted at the base. Pappus of 3, 4, or 5 short stiff bristles, each tipped by a globular or club-shaped gland.—Herbs, either glabrous or glandular, pubescent. Leaves opposite. Flower-heads usually hemispherical, small.

A genus of a very few American species, one of which spreads all round the warmer zone of the globe.

1. ***A. viscosum***, *Forst.*; *DC. Prod.* v. 111. Stem annual, erect or ascending, rooting at the base, and possibly renewed a second year by a creeping rhizome or stolons, glabrous or glandular-pubescent, 1 to 2 ft.

high. Leaves few, opposite, petiolate, from ovate to broadly triangular, usually coarsely toothed, from barely 1 in. long and rather thick and rough, to 3 or 4 in. long, thin and glabrous. Flower-heads hemispherical, 3 to 4 lines diameter, in a loose spreading terminal 2- or 3-chronous panicle, with very small leaves under the branches. Involucral bracts oblong, in about 2 rows. Florets numerous, often hairy outside. Achenes more or less mucate or rarely quite smooth.—Wight, *lc.* t. 1087, 1088.

Queensland. Endeavour river, *Banks and Schimper*; Rockhampton and Rockingham Bay, *Bowman*; Lizard Island, *McGillivray*.

N. S. Wales. Hawkesbury river, *R. Brown*.

S. Australia. Entrance to the Murray river, *Willcham*. Probably introduced.

This is a common weed in the warmer regions of the globe, especially in the Old World, where it extends northward to Japan. The species should include all those published by De Candolle and others from the Old World, and at least *A. bracteata* and *A. triangulare* among the American ones.

TRIBE IV. ASTEROIDEÆ.—Leaves alternate or very rarely opposite. Flower-heads either heterogamous or dioecious, the female florets ligulate or filiform, the hermaphrodites or males tubular, and 4- or 5-toothed, or in very few exceptional species all the florets hermaphrodite and tubular. Anthers obtuse acute or tailed at the base. Style-branches in the hermaphrodite florets usually more or less flattened, produced beyond the stigmatic lines into short and obtuse or lanceolate or almost subulate tips, papillose on the outside.

The majority of the genera are easily distinguished from *Anthemideæ* and *Senecionida* by the style, a few, however, with the disk-florets sterile, have, like similarly sterile disk-florets in *Anthemideæ* and *Gnaphalieæ*, the style undivided and obtuse or truncate without stigmatic lines. For these cases no positive character can be given, but the genera or species must be classed from general affinity or minor characters. Thus *Munera* is distinguished from *Anthemideæ* by the pappus, and *Pluchea* and the allied genera from *Gnaphalieæ* by the foliage and involucre. Very rarely the style-branches are almost subulate, but then the female florets prevent any confusion with *Vernoniaceæ*.

11. OLEARIA, Mœnch.

(Eurybia, *Cass.*; Steetzia, *Sond.*)

Involucres from broadly hemispherical to narrow-ovate, the bracts imbricate in several rows, the margins more or less dry or scarious, without herbaceous tips. Receptacle pitted, the borders of the pits often denticulate, but without scales. Florets of the ray female in a single row, or fewer than those of the disk, usually ligulate, spreading, very rarely slender and filiform or deficient. Disk-florets numerous or few, hermaphrodite, tubular, gradually tapering to the base in most species of the first two sections, more abruptly contracted in some others, usually 5-lobed. Anthers often acute at the base or with minute tails, rarely obtuse. Style-lobes flattened with short obtuse or rarely lanceolate appendages, papillose on the back. Achenes striate, terete or slightly compressed. Pappus of numerous, usually unequal, capillary bristles.—Shrubs undershrubs or very rarely herbs. Leaves alternate or rarely opposite. Heads solitary, corymbose or paniculate, terminal but sometimes appearing axillary from the shortness of the flowering branches. Ray-florets white or blue. Disk-florets yellow or rarely purplish or even

blue. The indumentum of the underside of the leaves is usually more or less present also on the branches and inflorescence.

The genus is limited to Australasia, there being, besides the 63 Australian species, which are all endemic, only about 20 others, all natives of New Zealand. It is, however, very closely allied to the extensive genus *Aster*, widely diffused over the temperate regions of the northern hemisphere, especially in America, not separated indeed from *Olearia* by any one definite character, and F. Mueller has recently proposed to unite the whole and several others to *Aster* itself. It appears to me, however, that independently of the convenience of retaining *Olearia* for the Australasian species, there is little risk of its being confounded with the northern genus. The habit of most species is very different. Where the achenes are the same or nearly so (as in the North American *Biotias*, which have the achenes as little compressed as in a few Australian species), the foliaceous-tipped involueral bracts of the former are a ready distinction. Some Australian species again are separated from all the American ones by their styles, others by their anthers, and most of them by the indumentum. There appear to be indeed better grounds for maintaining *Olearia* as distinct from *Aster* than for retaining *Erigeron*, which passes so gradually into it, and that again into *Campas*, and if all these were united into one, we should have a group quite unmanageable without dividing it into sections corresponding to the present genera, which would be in fact retaining the present arrangement, but with all the evils consequent on the nominal change.

That *Olearia* and *Eurybia* are inseparable even as sections has been shown by J. D. Hooker, Archer, and others, and I follow J. D. Hooker in adopting the former as the older name. Schultz-Bipontinus, under the idea that the genus is the *Shawia* of Forster, accepts the latter name, and accordingly, in the 'Polichia,' gives to all published species, good or bad, new names, as *Shawias*. This is, however, a mistake. Forster considered the true *Olearias* as *Asters*, and founded *Shawia* on a plant characterized specially by solitary flowers. It proved afterwards that this was not a constant character, and his genus was suppressed, and the circumstance that this abnormal peculiarity occurs on some specimens of one species of *Olearia*, can surely be no reason for now transferring the name founded on it to a large genus where it has not been observed in any other species.

In the subdivision of *Olearia*, I have adopted the main sections proposed by Archer (Journ. Linn. Soc. v. 17, 20), founded on the indumentum, which, with the exception of two or three species where it almost disappears, seems to be the most available in a genus where so many species pass into each other by almost insensible gradations.

SECTION I. **Dicerotriche.**—*Indumentum of the underside of the leaves (usually either silvery-shining, tomentose or loosely villous) consisting of centrally-attached or decurately forked (T-shaped) hairs, otherwise simple.*

Leaves opposite.

Leaves oblong, flat, 2 to 4 in. long, densely tomentose underneath.

Flower-heads large. Ray-florets usually 10 to 12 1. *O. megalophylla*.

Flower-heads small. Ray-florets usually 2 or 3 2. *O. chrysophylla*.

Leaves narrow-oblong, with recurved margins, densely silky underneath 3. *O. alpicola*.

Leaves linear, with revolute margins 4. *O. rosmarinifolia*.

Leaves lanceolate, viscid, smooth (not rugose) above, white underneath 5. *O. viscosa*.

Leaves alternate.

Flower-heads very large, solitary, on long peduncles. Leaves ovate, 2 to 4 in. long.

Leaves denticulate, closely silky or silvery underneath 6. *O. grandiflora*.

Leaves mostly entire, densely and softly cottony underneath 7. *O. pannosa*.

Flower-heads small, numerous and paniculate, or rather larger and shortly pedunculate. Indumentum close.

Leaves prominently reticulate on the upper surface.

Leaves broadly ovate or elliptical, mostly 3 or 4 in. long, entire or slightly toothed.

- Indumentum very silvery and close. Involucres narrow-cylindrical, few-flowered 8. *O. oligantha*.
 Indumentum silvery and close. Involucres turbinate, few-flowered 9. *O. argophylla*.
 Indumentum white and soft. Involucres hemispherical, many-flowered 10. *O. cydoniaefolia*.
 Leaves from obovate to oblong or lanceolate, mostly obtuse, sinuate-toothed and under 2 in. long 11. *O. myrsinoides*.
 Leaves not reticulate on the upper surface.
 Leaves obovate or oblong, entire, under 1 in. long 12. *O. persoonioides*.
 Leaves small, cuneate, mostly toothed at the end 13. *O. obcordata*.
 Leaves narrow-linear, crowded.
 Leaves pungent-pointed, mostly above 1 in. long 14. *O. pinifolia*.
 Leaves obtuse, mostly $\frac{1}{2}$ in. long 15. *O. ledifolia*.
 Flower-heads rather large, usually pedunculate and corymbose.
 Leaves ovate, loosely tomentose underneath 16. *O. dentata*.

SECTION II. *Asterotriche*.—Indumentum of the under side of the leaves consisting of stellate hairs, sometimes very close and almost mealy.

- Leaves alternate, mostly toothed or sinuate.
 Leaves ovate-oblong or lanceolate, smooth or scabrous above.
 Flower-heads rather small. Involucres broadly turbinate.
 Achenes hairy 17. *O. stellulata*.
 Leaves oblong-linear, sinuate-toothed, obtuse. Flower-heads rather large. Achenes hairy 18. *O. asterotricha*.
 Leaves ovate-lanceolate or oblong, very rugose. Flower-heads large. Achenes glabrous 19. *O. gravis*.
 Leaves ovate-lanceolate, acute, rather thin and somewhat glutinous. Flower-heads in pedunculate corymbs 20. *O. Nernstii*.
 Leaves alternate or opposite, narrow, quite entire.
 Leaves alternate, narrow-linear 21. *O. hygrophila*.
 Leaves mostly opposite, lanceolate 22. *O. viscidula*.

SECTION III *Eriotriche*.—Indumentum of the under side of the leaves consisting of densely intricate woolly hairs. Leaves alternate, often small.

- Flower-heads (usually small and ovoid) axillary or on very short axillary branchlets, forming long leafy racemes.
 Ray-florets slender, tubular, much shorter than the entire part of the style 23. *O. tubuliflora*.
 Ray-florets ligulate, but shorter than their style 24. *O. axillaris*.
 Ray-florets ligulate, scarcely longer than their style. Flower-heads sessile. Western species.
 Leaves 3 to 6 lines long, linear to oblong-cuneate, with recurved margins 25. *O. revoluta*.
 Leaves 1 to 2 lines long, linear, with revolute margins . . . 26. *O. erillifolia*.
 Ray-florets conspicuously exceeding the style.
 Eastern species.
 Leaves 1 to 4 lines long, obovate to oblong-linear, the upper surface glabrous or scabrous 27. *O. ramulosa*.
 Leaves under 1 line, narrow, the upper surface glabrous or scabrous. Flower-heads usually very small and numerous 28. *O. floribunda*.
 Leaves mostly under 1 line and often under $\frac{1}{2}$ line, obovate oblong or globular, the upper surface glabrous or tomentose 29. *O. lepidophylla*.
 Leaves narrow-linear, 3 to 6 lines long. Flower-heads forming short, dense, terminal, leafy racemes 30. *O. subspicata*.

Western species.

Leaves very small, mostly obovate and 3-toothed 31. *O. exiguifolia*.

Leaves narrow-linear, $\frac{1}{4}$ to $\frac{3}{8}$ in. long, quite entire 32. *O. Cassinia*.

Flower-heads usually hemispherical, terminal, solitary or corymbose.

Rays conspicuous.

Leaves mostly reflexed, clustered, about 1 line long. Flower-heads solitary 33. *O. ramosissima*.

Leaves oblong-cuneate, 3 to 4 lines long.

Flower-heads solitary, on long branchlets 34. *O. pimeleoides*.

Flower-heads corymbose or on short branchlets 35. *O. iodochroa*.

Leaves linear, 2 to 4 lines long, with revolute margins. Plant glandular-pubescent and slightly woolly 36. *O. adenolasia*.

(See also 51. *O. muricata*, which is sometimes very near *O. adenolasia*, 50. *O. he-leophila*, which has often a little wool about the involucre, and 62. *O. arguta*, which has the young foliage sometimes woolly.)

Flower-heads cylindrical, with few tubular florets, without any ray . 37. *O. canacephala*.

SECTION IV. **Adenotriche**.—*Plant glabrous, usually glutinous. Involucre ovoid, turbinate or rarely hemispherical, the bracts usually obtuse, rigid, scarious on the margins and often ciliate.*

Flower-heads solitary or in leafy corymbs or panicles.

Leaves flat, obovate cuneate or oblong-linear, mostly toothed.

Flower-heads solitary, almost sessile above the last leaf.

Flower-heads very large. Involucre broadly turbinate, above $\frac{1}{2}$ in. long.

Leaves narrow, cuneate 38. *O. magniflora*.

Leaves small, obovate 39. *O. calcarea*.

Flower-heads small. Involucre almost hemispherical, 3 to 4 lines long.

Leaves small, obovate 40. *O. Muelleri*.

Leaves narrow, oblong or lanceolate 41. *O. Stuartii*.

Leaves flat, linear or linear-cuneate, entire or toothed.

Flower-heads small, solitary or in an oblong panicle 42. *O. decurrens*.

Flower-heads ovoid, corymbose 43. *O. glutinosa*.

Leaves linear or small, quite entire, with revolute margins.

Flower-heads ovoid (except *O. imbricata*), nearly sessile, solitary or corymbose.

Leaves slender, $\frac{1}{2}$ to in. long or more. Eastern species . . . 43. *O. glutinosa*.

Leaves erect or spreading, about $\frac{1}{2}$ in. long. Western species . 44. *O. passerinoides*.

Leaves erect, under $\frac{1}{2}$ in. long. Eastern species 45. *O. teretifolia*.

Leaves very spreading or recurved, under $\frac{1}{2}$ in. long. Eastern species 46. *O. Hookeri*.

Leaves very short, thick, spreading. Involucre more hemispherical. Western species 47. *O. imbricata*.

(See also *O. tenuifolia*, which has the involucral bracts rather obtuse.)

Flower-heads small, numerous, in a leafless corymbose panicle.

Leaves elliptical-oblong or lanceolate, $1\frac{1}{2}$ to 3 in. long . . . 48. *O. elliptica*.

Leaves narrow-linear, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long 49. *O. glandulosa*.

SECTION V. **Merismotriche**.—*Glabrous, glandular-pubescent or hirsute, and often glutinous, the hairs simple rigid, white or transparent and septate. Involucre hemispherical, with narrow, usually acute bracts.*

Flower-heads terminal, the peduncles mostly shorter than the heads.

Leaves usually under $\frac{1}{2}$ in. long. Involucres under $\frac{1}{2}$ in. diameter.

Glabrous or slightly glandular-pubescent. Leaves linear, with

- slightly recurved margins, small and distant or long and crowded. Panicles loose, divaricate. 50. *O. heleophila*.
- Glabrous glandular-pubescent or muricate. Leaves linear, the margins revolute, small and obtuse. Panicles loose, divaricate 51. *O. muricata*.
- Muricate, scabrous or hispid. Panicles loose, divaricate. Leaves linear, mucronate, erect, the margins revolute . . . 52. *O. strigosa*.
- Leaves obovate-cuneate or almost linear, entire or 3-toothed . 53. *O. paucidentata*.
- Very glandular-pubescent. Leaves linear. Panicles oblong, narrow 54. *O. stricta*.
- Flower-heads rather large, few, terminal or in the upper axils, on peduncles shorter than or rarely exceeding the leaves. Leaves linear, $\frac{1}{2}$ to 2 in. long. Slightly glandular-pubescent. Leaves slender. Peduncles mostly exceeding the leaves. Involucre scarcely $\frac{1}{2}$ in. diameter . . 55. *O. tenuifolia*.
- Very viscid-pubescent or hirsute. Corymb dense. Involucre about $\frac{1}{2}$ in. diameter, the bracts unequal 56. *O. adenophora*.
- Very scabrous. Flower-heads few, almost sessile. Involucre nearly $\frac{1}{2}$ in. diameter, the bracts nearly equal 57. *O. homolepis*.
- Leaves oblong-cuneate or almost linear, toothed. Plant glabrous, glutinous. Involucres much imbricate 41. *O. Stuartii*.
- Leaves obovate or oblong, crenate, very viscid. Peduncles longer than the leaves. Involucres scarcely $\frac{1}{2}$ in. diameter . . . 58. *O. xerophila*.
- Flower-heads solitary, on peduncles very much longer than the leaves. Leaves obovate-oblong to lanceolate. Glabrous. Peduncles with subulate bracts. Involucre much shorter than the disk. 59. *O. Ferresii*.
- Glabrous or hispid. Peduncles without any or with only one bract. Involucre as long as the disk. Leaves mostly oblong, obtuse, coarsely toothed. Southern and Western species 60. *O. rudis*.
- Leaves lanceolate, acute, entire or with 2 or 3 acute teeth towards the end. Tropical species 62. *O. arguta*.
- Leaves linear. Leaves hoary-hispid 61. *O. picridifolia*.
- Leaves ciliate, otherwise glabrous 63. *O. ciliata*.

Eurybia chrysotricha, Ten. Cat. Hort. Neap. 85, is supposed by Lindley, Bot. Reg. Misc. 1841, 19, to be from Australia. Tenore however says that it was raised from seed sent by Boupland from America. At any rate the character given is wholly insufficient for identifying it.

SECTION I. DICEROTRICHE, *Archer*.—Indumentum of the under side of the leaves (usually either silvery-shining tomentose or loosely villous) consisting of centrally attached or divaricately forked (T-shaped) hairs, otherwise simple.

1. ***O. megalophylla***, *F. Muell. Fragm.* v. 70. A tall shrub, the indumentum dense, almost woolly, consisting of rather loose divaricately forked hairs. Leaves opposite, shortly petiolate, broadly or narrow-oblong, obtuse, 2 to 4 in. long, coriaceous, shining above, densely tomentose underneath. Flower-heads rather large, in a terminal corymb. Involucre broadly ovoid or almost hemispherical, tomentose, 3 or 4 lines long, much imbricate. Ray-florets about 10 to 12. Disk-florets more numerous. Anthers with small but distinct points at the base. Style-appendages very short, obtuse. Achenes nearly glabrous. Pappus nearly equal or a few of the outer bristles rather

shorter.—*Eurybia megalophylla*, F. Muell. in Proc. Roy. Soc. Tasm. iii. 228; *Aster megalophyllus*, F. Muell. Fragm. v. 70.

Victoria. Bushy declivities of the Australian Alps, Cobberas mountains, Mount Buller, etc., *F. Mueller*. This and the two following species are very closely allied to each other.

2. *O. chrysophylla*, *Benth.* A shrub, attaining 6 ft. (*A. Cunningham*), the indumentum sometimes close and silvery, but more frequently dense and soft, white or brown, sometimes quite woolly, consisting of centrally-attached or divaricately-forked hairs. Leaves opposite, oblong, obtuse, entire or sinuate-denticulate, 2 to 4 in. long, glabrous on the upper side. Flower-heads numerous, small, in corymbose panicles. Involucres ovoid, pubescent or nearly glabrous. Florets about 6 to 8, of which 2 or 3 are rays. Anthers with minute points at the base. Style-appendages short, obtuse. Pappus nearly equal.—*Eurybia chrysophylla*, DC. Prod. v. 266; *Eurybia oppositifolia*, F. Muell. Fragm. ii. 88.

N. S. Wales. In the interior, N. of Bathurst, *A. Cunningham*; Guy-Fox Peak, Arne river, and Mount Mitchell, *Beckler*; also Macleay river, *Beckler*, with a very dense wool.

3. *O. alpicola*, *F. Muell. Fragm. v. 70.* A tall shrub, the indumentum dense, almost silvery, consisting of intricate stipitate forked or centrally attached hairs. Leaves mostly opposite, shortly petiolate, oblong-lanceolate to almost linear, 2 to 4 in. long, coriaceous, glabrous on the upper side, the margins slightly recurved. Flower-heads numerous, small, in a terminal corymbose panicle. Involucre ovoid, tomentose, with about 4 to 6 ray-florets and rather more numerous disk-florets. Anthers with minute points at the base. Style-appendages short, obtuse. Achenes glabrous (in all the specimens examined). Pappus nearly equal.—*Eurybia alpicola*, F. Muell. in Proc. Roy. Soc. Tasm. iii. 229; *Aster alpicola*, F. Muell. Fragm. v. 70.

Victoria. Along rivulets and springs in the Australian Alps, at an elevation of 1000 to 5000 feet, *F. Mueller*.

4. *O. rosmarinifolia*, *Benth.* An erect shrub with virgate branches, hoary or silvery with a close tomentum, consisting of centrally attached hairs. Leaves opposite, sessile, narrow linear, acute or obtuse, mostly $1\frac{1}{2}$ to 3 in. long, glabrous or scabrous above, the margins so closely revolute as to conceal the tomentose under-surface except the midrib. Flower-heads on axillary peduncles, forming usually a terminal leafy panicle. Involucre turbinate, tomentose. Ray-florets 6 to 8; disk-florets more numerous. Anthers attenuate at the base, but without prominent points. Style-appendages obtuse. Achenes glandular-papillose, not hairy. Pappus rather unequal, but no very short bristles.—*Eurybia rosmarinifolia*, DC. Prod. v. 268.

N. S. Wales. In the interior north of Bathurst, *A. Cunningham*; New England, *C. Stuart*; tributaries of Clarence river, *Beckler*. Also in *Leichhardt's* collection.

5. *O. viscosa*, *Benth.* A bushy shrub of 4 to 5 ft., the young shoots often viscid. Leaves opposite, petiolate, oblong-lanceolate, narrowed at both ends but usually obtuse, 2 to 3 in. long, glabrous above, silvery-white underneath with a close tomentum consisting of centrally attached hairs. Flower-heads small, numerous, in corymbose panicles. Involucral bracts few, glabrous or glandular-pubescent. Florets usually 4 to 6, of which 1 or 2

are ligulate. Anthers with distinct joints at the base. Style-appendages very short. Achenes glabrous or hairy in the upper part. Pappus equal or with a few rather shorter bristles.—*Aster viscosus*, Labill. Pl. Nov. Holl. ii. 53. t. 293; *Eurybia viscosa*, Cass.; DC. Prod. v. 266; Hook. f. Fl. Tasm. i. 173.

Victoria. On the shores of Lake King, *F. Mueller*.

Tasmania. Derwent river and islands of Bass's Straits, *R. Brown*. Abundant on the sides of mountains, especially in the southern parts of the colony, emitting a strong musky smell, *J. D. Hooker*.

De Candolle refers here *Balbisia Caledoniæ*, Spreng. Syst. iii. 569, said by the latter author to be from New Caledonia, *Forster*, but this is probably a mistake.

6. **O. grandiflora**, *Hook. Ic. Pl. t. 862*. Stature apparently of *O. pinnosa*. Branches, peduncles and under side of the leaves densely clothed with a close glossy intricate tomentum, white or reddish and consisting of centrally attached hairs. Leaves alternate, petiolate, ovate or elliptical, acutely denticulate, narrowed at the base, 2 to 5 in. long, quite glabrous and reticulate on the upper side as in *O. pinnosa* but of a thinner texture. Flower-heads hemispherical, on long terminal peduncles like those of *O. pinnosa*, but still larger. Florets, achenes and pappus of *O. pinnosa*—*Steelzia grandiflora*, Sond. in Linnæa, xxv. 452; *Aster Smideri*, *F. Muell. Fragm. v. 83*.

S. Australia. Lofty and Onkaparinga ranges, *F. Mueller*; near Adelaide, *C. Dutton*.

7. **O. pannosa**, *Hook. Ic. Pl. under n. 862*. A shrub of several feet or sometimes an undershrub, the branches, peduncles and under side of the leaves clothed with a soft dense white or reddish tomentum, consisting of centrally attached hairs and sometimes almost woolly. Leaves alternate, petiolate, from broadly ovate-cordate to oblong, obtuse, entire, 2 to 3 in. long, glabrous above, with the reticulations often much depressed. Flower-heads large, hemispherical, terminal or on axillary peduncles, often thickened under the head. Involucres often above 1 in. diameter, the bracts imbricate, acute, the inner ones as long as the disk. Ray-florets $\frac{3}{4}$ to 1 in. long. Anthers of the disk-florets acute at the base, but without protruding points. Style-lobes long, with short obtuse appendages. Achenes long, hirsute. Pappus very copious, the outer bristles gradually shorter. *Steelzia pannosa*, Sond. in Linnæa, xxv. 451; *S. ovata*, Sond. l. c. 452, and *S. Muelleri*, Sond. l. c. 453; *Aster pannosus*, *F. Muell. Fragm. v. 83*; *Eurybia pannosa*, *F. Muell. Pl. Vict. t. 32*; *E. cardiophylla*, *F. Muell. in Linnæa, xxv. 398*.

Victoria. Mount Remarkable, Light River, Mount M'Ilvor, *F. Mueller*.

S. Australia. Summit of a mountain near Port Lincoln, *R. Brown*; on the Murray, *Whittaker*; Rivoli Bay, *F. Mueller, Robertson*; Tattiana country, *Woods*; Port Lincoln, *Wilhelmi*.

The narrow-leaved forms with more numerous flower-heads are apparently from old shrubs, the large broad-leaved ones with very long peduncles and large heads, probably from luxuriant shoots grown up when old stems have been cut down.

8. **O. oliganthema**, *F. Muell. Herb.* Apparently allied to *O. argophylla*. Leaves in the specimens alternate, petiolate, ovate, about 2 in. long, entire or slightly sinuate-toothed, glabrous and reticulate above, silvery-shining underneath with a very close tomentum consisting of centrally attached hairs. Flower-heads small and numerous in a dense terminal corymb. Involucres

cylindrical, nearly glabrous. Florets 4 to 6, of which 1 or 2 ligulate. Anthers with minute points. Style-lobes long, with short obtuse appendages. Achenes glandular-pubescent. Pappus of unequal bristles, some of the inner ones thickened upwards.

N. S. Wales. Blue Mountains, *C. Moore*, *Woolfs*, in both cases single small specimens in Herb. F. Mueller.

9. ***O. argophylla***, *F. Muell. Fragm.* v. 68. A tree attaining 20 to 25 ft., emitting a strong musky smell, the indumentum close and silvery-shining, consisting of centrally affixed hairs. Leaves alternate, petiolate, from oval-elliptical to oblong-lanceolate, acute at both ends, more or less callous-denticulate or rarely quite entire, 3 to 5 in. long, very much reticulate and glabrous above or with minute shining hairs, silvery-silky underneath. Flower-heads small, numerous, in large terminal corymbs. Involucre oblong-turbinate. Ray-florets about 3 to 5; disk-florets 6 to 8. Anthers with minute points at the base sometimes scarcely perceptible. Style-appendages short, obtuse. Achenes sparingly hirsute. Pappus copious, nearly equal, except a few short outer bristles, which are rarely wanting.—*Aster argophyllus*, Labill. Pl. Nov. Holl. ii. 52. t. 201; Bot. Mag. t. 1563; *F. Muell. Fragm.* v. 68; *Eurybia argophylla*, Cass.; DC. Prod. v. 267; Hook. f. Fl. Tasm. i. 172.

N. S. Wales. Port Jackson, *M. Arthur*; Mittagong range, *Woolfs*.

Victoria. Genoa river and Sumat river, *F. Mueller*; Corner Inlet, *Wilhelmi*; Bulla-rock Range, *Whan*.

Tasmania. Derwent river and Port Dalrymple, *R. Brown*.—Common in forests in rich damp soils, *J. D. Hooker*.

10. ***O. cydoniæfolia***, *Benth.* A tall shrub, the indumentum soft, very white, not so close as in *O. argophylla*, but similarly consisting of centrally affixed hairs. Leaves alternate, petiolate, ovate or elliptical, obtuse or almost acute, entire or slightly sinuate-toothed, mostly 3 to 4 in. long, the upper surface glabrous, at first smooth but finely reticulate when full grown, white-tomentose underneath. Flower-heads larger than in *O. argophylla*, in terminal panicles. Involucres hemispherical, tomentose, enclosing numerous florets but only seen young.—*Aster cydoniæfolius*, A. Cunn. Herb.; *Eurybia cydoniæfolia*, DC. Prod. v. 267; *E. Beckleri*, *F. Muell. Veg. Chath. Isl.* 21.

N. S. Wales. In the N.W. interior, *Fraser*; Clarence river, *Beckler*; Apsley Falls, *Leichhardt*. The New Zealand station given by De Candolle arose from some mistake. Cunningham's specimens, as appears from his herbarium, were from Fraser.

11. ***O. myrsinoides***, *F. Muell. Fragm.* v. 69. A shrub, usually low and straggling or densely bushy, the branches, peduncles and under side of the leaves closely silvery or silky-tomentose with centrally attached hairs. Leaves alternate, in the original form nearly sessile, obovate to oblong, very obtuse, minutely denticulate, under $\frac{1}{2}$ in. long, the upper surface glabrous, shining and much reticulate. Flower-heads in the original form narrow, 3 to 5 together on axillary peduncles forming a leafy oblong panicle. Involucre obconical. Florets 4 to 8, of which 2 or 3 ligulate. Anthers with more or less distinct minute points at the base or sometimes scarcely acute. Style-appendages short, obtuse. Achenes glabrous. Pappus-bristles nume-

rous and very unequal.—*Aster myrsinoides*, Labill. Pl. Nov. Holl. ii. 53. t. 202; F. Muell. Fragm. v. 69; *Eurybia myrsinoides*, Nees, Gen. et Sp. Ast. 146; DC. Prod. v. 268; Hook. f. Fl. Tasm. i. 174.

Victoria. Port Phillip, *R. Brown*: Delatite river, Loddon plains, Wilson's Promontory, etc., *F. Mueller*.

Tasmania. Port Dalrymple and Derwent river, *R. Brown*; generally in Lilly districts, *J. D. Hooker*.

Var. *serrata*, DC. Leaves sessile, obovate to oblong, $\frac{1}{2}$ to 1 in. long, rounded at the end but acutely and rigidly denticulate. Florets 4 to 8 in the head. Mount Disappointment and Wilson's Promontory, *F. Mueller*.

Var. *erubescens*, F. Muell. Leaves shortly petiolate, obovate, oblong or lanceolate, often acute, 1 to 2 in. long, acutely and rigidly or rarely minutely denticulate. Heads larger with 3 to 5 florets in the ray and 6 to 8 in the disk or even more.—*Aster erubescens*, Sieb. Pl. Exs.; *Eurybia erubescens*, DC. Prod. v. 267; Hook. f. Fl. Tasm. i. 173.

N. S. Wales. Port Jackson to the Blue Mountains and in the interior to Lachlan river, *A. and R. Cunningham*, *Sieber*, n. 339, and others.

Victoria. Rocky barren scrubby places from the Glenelg to Wilson's Promontory, in the Grampians, and over a great part of Australia Felix, *F. Mueller* and others.

Tasmania. Derwent river, *R. Brown*; not unfrequent throughout the island, *J. D. Hooker*.

All the varieties are said to smell of musk.

12. ***O. persoonioides*, Benth.** A dwarf bushy shrub rarely exceeding 3 ft. Leaves alternate, petiolate, from obovate to oblong, very obtuse, narrowed at the base, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, very smooth and shining above, silvery or silky-tomentose underneath with centrally attached hairs. Flower-heads small, rather numerous, forming leafy panicles. Involucres ovoid. Ray-florets 3 or 4, white; disk-florets about 10 to 12. Anthers with minute points at the base. Style-appendages almost acute. Achenes hairy. Pappus with a few outer shorter bristles.—*Eurybia persoonioides*, DC. Prod. v. 267; Hook. f. Fl. Tasm. i. 174.

Tasmania. Table Mountain, Derwent river, *R. Brown*; generally in alpine situations, *J. D. Hooker*.

Var. *lanceolata*. Leaves lanceolate, almost acute. Flower-heads fewer, but scarcely larger. Achenes glabrous.

Var. *alpina*. Flower-heads fewer and larger, with rather more florets. Achenes glabrous.—*Eurybia alpina*, Hook. f. Fl. Tasm. i. 174. t. 12. Only in alpine situations, *J. D. Hooker*.

13. ***O. obcordata*, Benth.** A small bushy shrub of about 2 ft. with a strong musky odour (*J. D. Hooker*). Leaves alternate, cuneate and obtusely 3- or 5-toothed at the end or obcordate, mostly under $\frac{1}{2}$ in. long, the upper surface as in *O. persoonioides*, glabrous and not reticulate, the under surface white with a close tomentum consisting of centrally attached hairs. Flower-heads mostly solitary, pedunculate. Involucres ovoid, with about 3 or 4 ligulate florets, and about as many in the disk. Anthers with very minute points at the base or only acute. Style-appendages rather obtuse. Achenes glabrous. Pappus slightly unequal.—*Eurybia obcordata*, Hook. f. in Hook. Lond. Journ. vi. 108; Fl. Tasm. i. 174. t. 42; *Aster obcordatus*, F. Muell. Fragm. v. 69.

Tasmania. Table Mountain, Derwent river, *R. Brown*; generally on mountains at from 3000 to 4000 feet, *J. D. Hooker*.

14. ***O. pinifolia*, Benth.** A rigid bushy shrub with stout tomentose

branches. Leaves alternate, crowded, narrow-linear, rigid, pungent-pointed, the margins closely revolute, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, glabrous and smooth above, the under side silvery-silky with centrally-attached hairs, but almost wholly concealed. Flower-heads mostly solitary, pedunculate. Involucre turbinate. Ray-florets about 8 to 10, those of the disk rather more numerous. Anthers with points at the base, but I have not found them so distinctly tailed as figured. Style-appendages short, obtuse. Achenes glabrous. Pappus rather unequal.—*Erythra pinifolia*, Hook. f. in Hook. Lond. Journ. vi. 108, and in Fl. Tasm. i. 177. t. 45; *Aster pinifolius*, F. Muell. Fragin. v. 71.

Tasmania. Table Mountain, Derwent river, *R. Brown*; Mount Wellington and Vale of Belvoir, *Gunn*; Mount Lapeyrouse, *C. Stuart*.

15. *O. ledifolia*, *Beath*. A small bushy or diffuse shrub, with thick branches. Leaves alternate, crowded, oblong-linear, obtuse, with closely revolute margins, under $\frac{3}{4}$ in. long, the upper surface glabrous or sprinkled with a few centrally-attached hairs, the under side rusty or silvery-tomentose. Flower-heads solitary on peduncles rarely as long as the leaves. Involucre turbinate, with obtuse bracts. Ray-florets about 8 to 10; disk-florets rather more numerous. Anthers with distinct points at the base. Style-appendages short, obtuse. Achenes glabrous. Pappus with a few of the outer bristles shorter than the others.—*Erythra ledifolia*, DC. Prod. v. 269; Hook. f. Fl. Tasm. i. 177; *Aster ledifolius*, A. Cunn. Herb.

Tasmania. Table Mountain, Derwent river, *R. Brown*; summit of Mount Wellington, *Fraser* and others; Mount Lapeyrouse, *C. Stuart*.

16. *O. dentata*, *Murch*; DC. Prod. v. 271. A tall rather coarse shrub, the branches and under side of the leaves densely tomentose, with divaricate stipitate hairs. Leaves alternate, petiolate, ovate or almost orbicular, obtuse, sinuate coarsely-toothed or entire, mostly 1 to 2 in. long, or when very luxuriant longer and narrower, rather thick, scabrous or loosely hairy on the upper side. Flower-heads large, on peduncles very variable in length, not numerous, but forming usually a terminal corymb. Involucre hemispherical, $\frac{1}{2}$ to $\frac{3}{4}$ in. diameter. Ray-florets rather numerous, white or blue; disk-florets scarcely exceeding the involucre. Anthers without prominent points. Style-appendages very short and obtuse. Achenes usually very hairy. Pappus-bristles in two distinct series, the outer ones not half so long as the inner ones.—*Aster dentatus*, Andr. Bot. Rep. t. 61; *A. tomentosus*, Schrad. in Wendl. Sert. Hann. 8, t. 24 (DC.); *A. ferrugineus*, Wendl. in Flora, 1819, 676; *Diplopappus rotundifolius*, Less. in Linnaea, vi. 116; *Olearia rotundifolia*, DC. Prod. v. 271.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, n. 341, and others; southward to Illawarra, *Backhouse*; and Twofold Bay, *F. Mueller*.

Some botanists distinguish *O. rotundifolia* from *O. dentata* by the longer peduncles, others reverse these characters. Specimens with toothed leaves have usually but not always smaller flower-heads than those with entire leaves, and may have been taken from older plants. I cannot perceive any constant difference in the colour of the pappus except what may be attributed to the process of desiccation.

SECTION II. ASTEROTRICHE, *Archer*.—Indumentum of the under side of the leaves consisting of stellate hairs.





F. Schönfeld, del. & lith.

Maeller, direct.

De Gruchy & Leigh, imp.

Eurybia astrotricha. F. M.

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The indumentum is generally very distinct from that of any other section. It is only when it is very close and short, as in *O. viscidula*, that it requires some care to distinguish it from that of the section *Dicerotriche*.

17. *O. stellulata*, DC. *Prod.* v. 272. An erect shrub of 3 to 5 ft. Leaves alternate, oblong or lanceolate, obtuse or acute, more or less sinuate-toothed or rarely almost entire, glabrous scabrous or stellate-hairy above, white or rusty underneath with a dense stellate tomentum, varying in size from all under $\frac{1}{2}$ in. in some specimens to above 2 or even 3 in. in others. Heads in the original form rather small, in leafy panicles. Involucre turbinate. Ray-florets about 8 to 12; disk-florets rather more numerous. Anthers scarcely annulate. Style-appendages almost acute. Achenes more or less hirsute. Pappus with a distinct external series of short bristles.—*Aster stellulatus*, Labill. Pl. Nov. Holl. ii. 50. t. 196; *Eurybia fulcida*, Cass.; Hook. f. Fl. Tasm. i. 175; *Diplostephium stellulatum*, Nees, Gen. et Sp. Ast. 187; *Aster phlogopappus*, Labill. Pl. Nov. Holl. ii. 49. t. 195; *A. phlogotrichus*, Spreng. Syst. iii. 525; *Eurybia quercifolia*, Cass. (DC.); *Diplostephium phlogotrichum*, Nees, Gen. et Sp. Ast. 186; *Olearia phlogopappa*, DC. *Prod.* v. 272; *Eurybia Gunniana*, DC. *Prod.* v. 268; Hook. f. Fl. Tasm. i. 175; *E. subrepanda*, DC. l. c.

Queensland. Port Bowen, *R. Brown*; Mount Hedlow, near Rockhampton, *Dallachy*.

N. S. Wales. Hastings river, *Fraser*; Twofold Bay, *F. Mueller*; Gabo Island, *Maplestone*.

Victoria. Australian Alps and Wilson's Promontory, *F. Mueller*, near Melbourne, *Robertson*.

Tasmania. Port Dalrymple and islands of Bass's Straits, *R. Brown*; very common throughout the island, *J. D. Hooker*.

Var. *canescens*. Leaves narrow-oblong, entire, $\frac{3}{4}$ to 2 in. long, hoary-tomentose on both sides.—Apsley river, *Fraser*; Severn river, New England, *C. Stuart*.

Var. *lirata*. Leaves lanceolate, 2 to 5 in. long, deeply furrowed by the impressed veins, almost bullate, obscurely sinuate-toothed or almost entire. Flower-heads larger and broader.—*Aster liratus*, Sims, Bot. Mag. t. 1509; *Diplostephium lyratum*, Nees, Gen. et Sp. Ast. 188; *Eurybia lirata*, DC. *Prod.* v. 267; Hook. f. Fl. Tasm. i. 175. t. 43.—Victoria and Tasmania, *R. Brown*, *J. D. Hooker*, *F. Mueller*, and others.

Var. *quercifolia*. Leaves oblong, obtuse, entire or obtusely toothed, 1 to 3 in. long, very much bullate, very scabrous above, densely stellate-tomentose and often tomentose underneath.

Aster quercifolius, Steb. Pl. Ex.; *Olearia quercifolia*, DC. *Prod.* v. 272; *Eurybia rufosa*, F. Muell.; Arch. in Journ. Linn. Soc. v. 22. Blue Mountains, *Secher*, n. 340, *A. Cunningham* and others; Victoria, *F. Mueller*; Tasmania, *R. Brown*.

18. *O. asterotricha*, *F. Muell. Fragm.* v. 79. A shrub, rough with a rigid stellate pubescence. Leaves alternate, oblong-linear, very obtuse, with revolute margins, more or less sinuate-toothed, mostly $\frac{3}{4}$ to 1 in. long, bullate and very scabrous above, tomentose underneath. Flower-heads rather large, solitary and terminal, or several in a terminal corymb. Involucre almost hemispherical, often above $\frac{1}{2}$ in. diameter. Ray-florets often above 20; disk-florets slightly exceeding the inner bracts. Anthers, style, achenes, and pappus of *O. stellulata*.—*Eurybia asterotricha*, *F. Muell. Fragm.* i. 111; Pl. Vict. t. 33; *Aster asterotrichus*, *F. Muell. Fragm.* v. 79.

Victoria. Glenelg river, Grampians, Mount Disappointment, Dandenong ranges, Gipps Land, *F. Mueller*.

Var. *parvifolia*. Leaves mostly under $\frac{1}{2}$ in. long.

N. S. Wales. Bargo Bush, *Beckhouse*; also near Portland in Victoria, *Robertson*.

The species only differs from *O. stellulata*, var. *quercifolia*, in the narrower leaves, and perhaps in the purple colour of the disk-florets.

19. ***O. gravis*, F. Muell. Fragm. v. 82.** An erect rigid shrub of a few feet, more or less hoary or rust-coloured, with a soft or scabrous stellate tomentum. Leaves alternate, oblong-lanceolate, obtuse or almost acute, irregularly toothed or nearly entire, 1 to 2 in. long, rugose or almost bullate, usually hoary above and more densely tomentose underneath. Flower-heads rather large, in a simple terminal corymb. Involucre above $\frac{1}{2}$ in. diameter, the bracts shorter than the disk, almost acute, the outer ones nearly as long as the inner. Anthers not auriculate. Style-appendages lanceolate. Achenes glabrous, rather long and somewhat compressed, but with very prominent ribs. Pappus with a distinct external series of short bristles.—*Aster gravis*, F. Muell. l. c.

N. S. Wales. Near Tenterfield, New England, *C. Stuart*.—Very nearly allied to the var. *quercifolia* of *O. stellulata*.

20. ***O. Nernstii*, F. Muell. Fragm. v. 81.** A shrub with elongated branches, loosely stellate-tomentose and apparently somewhat glutinous. Leaves alternate, ovate-lanceolate, acute, remotely and often acutely sinuate-toothed or nearly entire, 1 to 3 in. long, rather thin, glabrous and smooth above, loosely stellate-tomentose underneath. Flower-heads not large, in terminal pedunculate corymbs. Involucre almost hemispherical, 4 to 5 lines diameter, the bracts not very unequal. Ray-florets 15 to 20; disk-florets numerous, not much exceeding the involucre. Anthers not auriculate. Style-appendages shortly lanceolate. Achenes short, glabrous. Pappus with an external series of very short bristles.—*Aster Nernstii*, F. Muell. l. c.

Queensland. Near Ipswich, *Nernst*; towards Moreton Bay, *Leichhardt*.

N. S. Wales. Hastings river, *Beckler*; Richmond river, *C. Moore*, *Pawcett*.

21. ***O. hygrophila*, Benth.** Shrubby, with slender virgate branches, very sparingly stellate-tomentose. Leaves alternate, linear, mostly acute, entire with recurved margins, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, glabrous above, sparingly and minutely stellate-tomentose underneath. Flower-heads rather large, on slender peduncles, solitary or few in a loose corymb. Involucre scarcely $\frac{1}{2}$ in. diameter, the bracts narrow, somewhat unequal. Ray-florets 12 to 20, rather narrow; disk-florets numerous, scarcely exceeding the involucre. Anthers not auriculate. Style-appendages lanceolate. Achenes glabrous. Pappus-bristles slightly unequal, with very few short external ones or sometimes none at all.—*Eurybia hygrophila*, DC. Prod. v. 269.

Queensland. Stradbroke Island, Moreton Bay, *Fraser*.

22. ***O. viscidula*, Benth.** A tall rather slender shrub, more or less viscid. Leaves opposite, or rarely alternate, on luxuriant lateral shoots, linear-lanceolate, acute at both ends, entire, mostly 2 to 3 in. long, silvery-white underneath, with a close tomentum consisting of minute stellate hairs. Flower-heads small, numerous, in short axillary leafy panicles. Involucres glabrous or viscid-pubescent. Ray-florets 8 to 10; disk-florets rather more numerous. Anthers not auriculate. Style-appendages shortly lanceolate.

Achenes hirsute. Pappus with an external series of very short bristles. — *Eurybia viscidula*, F. Muell. Fragm. i. 59; *Aster Swainsonii*, F. Muell. Fragm. v. 71.

N. S. Wales. Near Cook's River, *E. Brownii*; in the interior, *E. brevifolia*; near Illawarra, *A. Cunningham*; near Goulburn, *C. Moore*.

SECTION III. ERIOTRICHE, *Arctostaphylos*. — Indumentum of the under side of the leaves consisting of densely imbricate woolly hairs. Leaves alternate. Anthers not auriculate.

Most of the species of this section are remarkable for their small leaves. In some viscid species the woolly tomentum nearly disappears, but it always remains sufficiently conspicuous on the under side of the leaves to distinguish them from those of the section *Adenotriche*.

23. **O. tubuliflora**, *Beuth.* A tall shrub, with numerous erect virgate branches more or less scabrous-pubescent or viscid, with an admixture of woolly tomentum especially on the under side of the leaves. Leaves narrow-linear, often clustered in the axils, mostly $\frac{1}{4}$ to 1 in. long, the margins revolute, glabrous or scabrous-pubescent above. Flower-heads small, sessile or nearly so in the axils, and shorter than the floral leaves. Involucre ovoid, under 2 lines long, the bracts very obtuse. Ray-florets 3 or 4, shorter than the undivided part of their style, tubular or scarcely expanded into a minute ligula; disk-florets 3 to 5, exceeding the involucre. Anthers, style, achenes, and pappus of *O. axillaris*, the bristles, however, usually fewer. — *Eurybia tubuliflora*, Sond. and Muell. in Linnaea, xxv. 455; *Aster tubuliflorus*, F. Muell. Fragm. v. 65.

Victoria. Mount M'Ivor, *F. Mueller*,

S. Australia. Lake Alexandrina, St. Vincent's Gulf, Lofty Ranges, etc., *F. Mueller*, *Hillebrand*, *Blandowski*.

Of *Eurybia actinostoides*, Sond. in Linnaea, xxv. 455, or *Aster artemisioides*, F. Muell. Fragm. v. 65, the majority of the specimens in F. Mueller's herbarium appear to me to be the same as *O. tubuliflora*, but Sonder describes the ligula of the ray-florets as equal to its style, and suggests that it is a variety of *O. ramulosa*, and that is probably the case with one of F. Mueller's specimens from Lake Alexandrina, where the two species appear to grow together.

24. **O. axillaris**, *F. Muell. Fragm. v. 64*. An erect much-branched shrub of 3 to 6 ft., more or less hoary or white with a close woolly tomentum. Leaves from obovate or oblong-cuneate and $\frac{1}{4}$ to $\frac{1}{2}$ in. long to linear or linear-lanceolate and $\frac{1}{2}$ to $\frac{3}{4}$ in. long, obtuse, entire, with revolute margins, woolly-white on both sides or glabrous and shining above. Flower-heads sessile in the axils, and shorter than the floral leaves, or very rarely 1 or 2 together on short axillary leafy shoots. Involucre ovoid, 2 to 3 lines long, the bracts obtuse. Ray-florets about 4 to 6, shorter than those of the disk, the small ligula not so long as the style, entire or 2- or 3-toothed; disk-florets about 6 to 10, exceeding the involucre. Style-appendages short. Achenes hairy or rarely glabrous. Pappus-bristles all nearly equal or occasionally a very few short outer ones. — *Eurybia*, sect. *Brachyglottis*, DC. Prodr. v. 265; *Aster axillaris*, F. Muell. Fragm. v. 64.

N. Australia. Dampier's Archipelago, N.W. coast, *A. Cunningham*.

Victoria. Common on the sandy seacoasts, *F. Mueller* and others.

Tasmania. Sandy hills of the N. coast and islands of Bass's Straits, *R. Brown, J. D. Hooker* and others.

S. Australia. Sandy hills of the coast both on the mainland and Kangaroo Island, *R. Brown, F. Mueller*, and others.

W. Australia. Goose Island Bay, *R. Brown*; sandy hills on the S. coast and on the west coast to Swan River, Murchison river, Shark's Bay, Dirk Hartog's Island, etc., *A. Cunningham*; *Baudin*; *Drummond*, n. 126, 129; *Preiss*, n. 89, 90, 91, 92, 93.

Very variable in the degree of woolliness and in the shape of the leaves. The following forms, described as distinct species, appear to pass very much one into the other, and are all uniform in essential characters:—

a. obovata. Leaves obovate to cuneate-oblong, very tomentose on both sides, or glabrous above. Flower-heads small.—*Eurybia oligantha*, DC. Prod. v. 266; *E. brachyglossa*, DC. l. c. 265 (with glabrous achenes); *E. candidissima*, Steetz in Pl. Preiss. i. 418.—Chiefly on the W. coast, from Swan River to Shark's Bay.

b. normalis. Leaves narrow-linear, mostly under $\frac{1}{2}$ in. Florets rarely more than 10 in the head.—*Eurybia axillaris*, DC. Prod. v. 266; Steetz in Pl. Preiss. i. 417; *E. capitellata*, DC. l. c.; *E. Dampieri*, DC. l. c. (with longer very narrow leaves).—The commonest form on the S. coast.

c. linearis. Leaves linear or linear-lanceolate, mostly above $\frac{1}{2}$ in. Florets usually 10 to 15 in the head.—*Eurybia linearifolia*, DC. Prod. v. 266.—Occasionally both on the S. and W. coasts.

25. ***O. revoluta*, F. Muell. Herb.** An erect, much-branched shrub, with the habit and foliage of some of the narrow-leaved forms of *O. axillaris*, or of the long-leaved forms of *O. ramulosa*, the ligula of the ray-florets much more developed than in the former, but less so than in the latter species. Leaves linear to oblong-cuneate, $\frac{1}{4}$ to $\frac{1}{2}$ in. long or rather more, obtuse, with revolute margins, glabrous or slightly tomentose above, white or hoary with a close woolly tomentum underneath. Flower-heads sessile or on short leafy peduncles in the axils, rarely exceeding the subtending leaf. Involucres broadly ovoid or almost turbinate, the bracts rather numerous. Ray-florets 4 to 8, the ligula exceeding its style. Disk-florets 6 to 10, exceeding the involucre. Style, achene, and pappus of *O. axillaris*.

W. Australia. Murchison and S. Hutt rivers, *Oldfield*.

Var. *minor*. Leaves small and narrow. Flower-heads small, with 2 or 3 florets in the ray, 3 to 5 in the disk.—King George's Sound and adjoining districts, *Harvey, Oldfield, Maxwell*.

26. ***O. exilifolia*, F. Muell. Fragm. v. 69.** A bushy shrub of 3 to 5 ft., closely resembling the common forms of *O. ramulosa*, but with shorter ligulae. Leaves linear, obtuse, with revolute margins, 1 to 2 lines long, woolly underneath. Flower-heads of *O. axillaris*, sessile or on very short leafy peduncles in the axils and usually exceeding the subtending leaf. Ray-florets 2 or 3, the ligula scarcely exceeding the style. Disk-florets 3 or 4, longer than the involucre. Style, achene, and pappus of *O. axillaris*.—*Aster exilifolius*, F. Muell. l. c.

W. Australia. Calcareous hills towards the Great Bight, *Maxwell*.

27. ***O. ramulosa*, Benth.** A shrub of 3 to 6 ft., much-branched, more or less scabrous-pubescent and sometimes slightly glutinous. Leaves crowded, usually very small and spreading, sometimes reflexed and clustered in the axils, varying from obovate or almost orbicular, about 1 line long, with a petiole of the same length, to oblong-linear and nearly $\frac{1}{2}$ in. long,

usually obtuse, with recurved or revolute margins, glabrous or scabrous-pubescent above, the under surface with more or less of a thin intricate wool, or sometimes the thin loose wool covering the whole plant. Flower-heads small, very numerous, usually sessile or terminating very short lateral leafy peduncles or branchlets, forming long leafy spikes or racemes along the branches. Involucre ovoid, much imbricate, nearly 3 lines long. Ray-florets 6 to 10, the ligula much longer than its style; disk-florets scarcely more numerous. Style branches short, the appendages triangular, almost as in some *Scacciaiidae*, but papillose only not hispid. Achenes short, slightly compressed, striate or 4-angled, hairy or rarely glabrous. Pappus with an outer series of short bristles, but sometimes very few only.

There are two principal forms, which are often distinguished as species, but only differ in the shape of the leaves.

a. microphylla. Leaves obovate or oblong, 1 to 2 lines long. Flower-heads small.—*Aster microphyllus*, Vent. Jard. Malm. under n. 83; *Diplostegium microphyllum*, Nees, Gen. et Sp. Ast. 191; *Eurybia microphylla*, DC. Prod. v. 270.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, Sieber, n. 338, and Fl. Mirt. n. 514, and others; Lachlan river, *A. Cunningham*.

b. communis. Leaves narrow, 1 to 6 lines long.—*Aster ramulosus* and *A. aculeatus*, Labill. Pl. Nov. Holl. ii. 51, 52, t. 198, 200; *A. exasperatus*, Link. Enum. Hort. Berol. ii. 328 (erroneously said to be from the Cape); *Diplostegium aculeatum*, Nees, Gen. et Sp. 192, and *D. ramulosum*, Nees, l. c. 193; *Eurybia ramulosa*, DC. Prod. v. 270; Hook. f. Fl. Tasm. i. 178; *E. propinqua*, *E. aculeata*, and *E. epileia*, DC. l. c.; *E. ericoides*, Steetz in Pl. Preiss. i. 423.

N. S. Wales. New England, *C. Stuart*; Mudgee, *Woolfs* (with glabrous glandular achenes).

Victoria. Port Phillip, *R. Brown*; abundant from the Glenelg to Gipps' Land, *F. Mueller* and others, Wimmera, *Dallachy*; in the Grampians (very rigid, with small flower-heads), *F. Mueller*; Mount Korong and Mount M'Ivor (with long very scabrous or woolly leaves and larger flower-heads), *F. Mueller*.

Tasmania. Derwent river, Port Dalrymple, islands of Bass's Straits, *R. Brown*; common throughout the island, *J. D. Hooker*.

S. Australia. S. coast, *R. Brown*; Rivoli, Holdfast and Guichen bays, *F. Mueller*; Memory Cove, *R. Brown* (with thicker longer narrow leaves).

28. **O. floribunda**, *Benth.* A much-branched shrub of 4 to 6 ft., with numerous very small clustered leaves and a profusion of small flower-heads on very short leafy branchlets, forming leafy racemes collected into large dense pyramidal panicles; closely allied to *O. ramulosa*, differing in the much smaller leaves, rarely above 1 line long, the involucre not above 1½ lines long. Florets about 6 to 10, of which 3 to 4 ligulate, their structure as well as the achenes and pappus as in *O. ramulosa*.—*Eurybia floribunda*, Hook. f. in Hook. Lond. Journ. vi. 109, and Fl. Tasm. i. 179. t. 45; *Aster florulentus*, *F. Muell.* Fragm. v. 82.

Victoria. Along torrents in the Australian Alps, *F. Mueller*.

Tasmania. Derwent river, *R. Brown*; common along the banks of rivers, *J. D. Hooker*.

S. Australia. Memory Cove, *R. Brown*.

29. **O. lepidophylla**, *Benth.* A much-branched shrub of 3 to 6 ft., usually white or hoary with a close dense woolly tomentum. Leaves minute, clustered in the axils, obovate-oblong or almost globular, very obtuse, with revolute margins, often all under ½ line long, but those subtending the

clusters or on luxuriant barren shoots sometimes narrow and above 1 line long. Flower-heads terminating short leafy branchlets, smaller than in *O. ramulosa*, but usually rather larger than in *O. floribunda*, and not so racemose. Florets, achenes, and pappus as in *O. ramulosa*.—*Aster microphyllus*, Labill. Pl. Nov. Holl. ii. 51. t. 199; *A. lepidophyllus*, Pers. Syn. Pl. ii. 442; *Diplostegium lepidophyllum*, Nees, Gen. et Sp. Ast. 190; *Eurybia lepidophylla*, DC. Prod. v. 270; Hook. f. Fl. Tasm. i. 178.

N. S. Wales. Darling river, *Victorian Expedition*.

Victoria. Grampians, *Wilhelmi*; Wimmera, *Dallachy*; N.W. part of the colony, *L. Morton*.

Tasmania. Derwent river, Adventure Bay, islands of Bass's Straits, *R. Brown*; sandy hills near the sea on the N. coast, also on the western and other mountains, *Gunn* and others.

S. Australia. From the Murray to St. Vincent's and Spencer's Gulfs, *F. Mueller* and others.

Eurybia beecheyphylla, *F. Muell.*: Send. in *Linnæa*, xxv. 455, appears to be founded on specimens with half-starved flower-heads, with the ray-florets sometimes not much developed, but certainly sometimes longer than their styles.

30. ***O. subspicata***, *Benth.* Shrubby, with erect virgate branches, more or less woolly-tomentose. Leaves erect, not clustered, linear, obtuse or nearly so, with revolute margins, rarely exceeding $\frac{1}{2}$ in., glabrous above, woolly-tomentose underneath. Flower-heads ovoid or almost cylindrical, shortly pedunculate or nearly sessile, crowded into short terminal racemes or spikes. Involucre much imbricate, 3 to 4 lines long, the bracts obtuse or nearly so. Ray-florets 3 to 6; the ligula much longer than the style; disk-florets about as many, longer than the involucre. Style-appendages lanceolate. Achenes silky-hairy. Pappus bristles rather unequal, but without any distinct series of short ones.—*Eurybia subspicata*, Hook. in Mitch. Trop. Austr. 293.

Queensland. Maranoa and Belyando rivers, *Mitchell*.

N. S. Wales. Darling river, *Victorian Expedition*; Murray desert, *F. Mueller*, *Dallachy*.

The species differs from *O. ramulosa* chiefly in its longer leaves and larger flower-heads.

31. ***O. exiguifolia***, *F. Muell. Fragm.* v. 67. A much-branched shrub of 3 to 4 ft., closely resembling the smaller forms of *O. ramulosa*, differing chiefly in the leaves, which are obovate-orbicular or broadly-cuneate, very obtuse and mostly 3-toothed, 1 to 2 lines long, narrowed into a short petiole. Flower-heads small, terminating short axillary branchlets. Florets, achenes, and pappus of *O. ramulosa*.—*Aster exiguifolius*, *F. Muell.* l. c.

W. Australia. Sand hummocks, Eyre's Relief, *Maxwell*.

32. ***O. Cassiniæ***, *F. Muell. Fragm.* v. 68. Erect, 6 to 8 ft. high, with numerous slender erect branchlets, slightly hoary, with a close fine intricate tomentum. Leaves narrow-linear, with revolute margins, $\frac{1}{4}$ to $\frac{3}{4}$ in. long, glabrous or with a minute woolly tomentum on the under side. Flower-heads small, numerous, nearly sessile in the upper axils, forming short leafy racemes arranged in an oblong or pyramidal panicle, or on short axillary branches in a looser panicle. Involucre ovoid, about 2 lines long, the bracts more glabrous and shining than in *O. ramulosa*. Ray-florets 2 or 3, with long

ligule; disk-florets 3 or 4, scarcely exceeding the involucre. Achenes hairy. Pappus-bristles not very unequal.—*Aster Cassinia*, F. Muell. l. c.

W. Australia. King George's Sound, R. Brown; banks of Lake Leven, Maxwell.

The preceding ten species, from *O. tubuliflora* to *O. Cassinia*, appear sometimes in the dried specimens to pass into each other by almost insensible gradations.

33. *O. ramosissima*, Benth. A shrub of 2 or 3 ft., with numerous rather slender branches, scabrous-pubescent, mixed with a little loose wool. Leaves minute, reflexed, clustered in the axils, lanceolate or linear, entire, with revolute margins, all under 1 line long or rarely the larger ones narrow and nearly 2 lines long, glabrous and smooth or scabrous above, with a thin loose wool underneath. Flower-heads solitary at the ends of the branchlets, forming an oblong or rarely corymbose leafy panicle. Involucre broadly turbinate, about 3 lines long, the bracts often coloured and jagged at the edge. Florets all blue (F. Mueller), those of the ray 12 to 15, more numerous in the disk and longer than the involucre. Achenes more or less villous. Pappus white, with a few short outer bristles.—*Eurybia ramosissima*, DC. Prod. v. 270; *Aster cyanodiscus* or *Olearia cyanodiscalis*, Muell. Fragm. v. 82.

N. S. Wales. Port Jackson, Gaudichaud (the specimens not seen); in the N.W. interior, A. Cunningham; near Exmouth, Fraser; near Clifton, New England, C. Stuart.

34. *O. pimeleoides*, Benth. A shrub of 4 or 5 ft., more or less hoary or white with a close woolly tomentum, the branches rigid and virgate or sometimes short and almost spinescent. Leaves mostly oblong-cuneate and 3 to 4 lines long, but passing into obovate and much shorter, or into longer and almost linear, obtuse, with recurved margins, glabrous or hoary above, tomentose underneath. Flower-heads solitary, terminal. Involucre broadly ovoid or almost hemispherical, the bracts much imbricate, almost acute. Ray-florets 10 to 15 or even more; disk-florets numerous, longer than the involucre. Style-appendages short, obtuse. Achenes silky-villous. Pappus-bristles unequal, but none very short.—*Eurybia pimeleoides*, DC. Prod. v. 268.

N. S. Wales. Lachlan and Darling rivers and all the branches in the west, Fraser, A. Cunningham, Victorian Expedition, etc.

Victoria. Mallee scrub on the Avon and Murray, F. Mueller; Winamra, Dallachy; N.W. districts, L. Morton.

S. Australia. Crystal Brook, Lake Torrens, F. Mueller.

Var. *minor*. Flower-heads smaller, ovoid, with fewer florets. — Murray desert, F. Mueller; Rotten Island, Wilhelm.

35. *O. iodochroa*, F. Muell. Fragm. v. 51. A bushy or spreading shrub, the branches slightly tomentose or glutinous or nearly glabrous. Leaves linear, cuneate-oblong or almost obovate, entire or 2- or 3-toothed towards the end, mostly 3 to 4 lines long, with recurved margins, rather thick, glabrous above, white or brown underneath with a close woolly tomentum. Flower-heads terminal, solitary or few in a dense terminal corymb. Involucre hemispherical, nearly $\frac{1}{2}$ in. diameter, the inner bracts coloured on the margin. Ray-florets 15 to 20; disk-florets purple (F. Mueller). Style-appendages very short. Achenes silky-hairy, rather short. Pappus with an

outer series of short bristles.—*Eurybia iodochroa*, F. Muell. *Fragm.* ii. 110; *Aster iodochrous*, F. Muell. *Fragm.* v. 81.

Victoria. Woody declivities of the Australian Alps, Nangatta Creek, Genoa river, Snowy River, etc., F. Mueller.

36. **O. adenolasia**, F. Muell. *Fragm.* v. 67. A shrub of several ft., with rigid virgate branches, more or less scabrous with a viscid pubescence, intermixed with a thin loose woolly tomentum. Leaves linear or linear-oblong, obtuse, with closely revolute margins, under $\frac{1}{2}$ in. long, glandular-scabrous or almost mucronate above, or on young shoots woolly on both sides, the lower ones occasionally longer and trifid. Flower-heads terminal, rather small. Involucre broadly ovoid or almost hemispherical, much imbricate and greener than in most species. Ray-florets 8 to 10; disk-florets rather more numerous. Style-appendages almost acute. Achenes hairy. Pappus with an outer series of short bristles.—*Diplopappus glandulosus*, Turcz. in Bull. Mosc. 1851, ii. 62; *Aster adenolasius*, F. Muell. *Fragm.* v. 67.

W. Australia, Drummond, *Ath. Coll.* n. 219, 5th Coll. n. 360; Phillips ranges, Maxwell.—This species approaches in many respects *O. muricata*, but has always more or less of the woolly tomentum of the section *Eriotriche* mixed with the glandular pubescence.

37. **O. ? conocephala**, F. Muell. *Fragm.* v. 79. A small compact densely-branched shrub, hoary or white with a close woolly tomentum. Leaves alternate, obovate or cuneate-oblong, under $\frac{1}{2}$ in. long, tomentose on both sides. Flower-heads solitary, terminating the short branches. Involucre cylindrical, above $\frac{1}{2}$ in. long, nearly glabrous, the bracts much imbricate and very obtuse. Florets 4 or 5, all tubular, slender, equal, and longer than the involucre, with 5 narrow linear lobes. Anthers very narrow, free in the florets examined, not auriculate. Style-branches long and narrow, but flattened, quite glabrous, stigmatic nearly to the end. Achenes glabrous, terete, striate, nearly 3 lines long, but not seen ripe. Pappus-bristles barbellate, almost plumose, a few of the outer ones shorter.—*Eurybia conocephala*, F. Muell. in Trans. Vict. Inst. i. 36; *Aster conocephalus*, F. Muell. *Fragm.* v. 67.

N. S. Wales. Desert of the Murumbidgee, Murray, and Darling, F. Mueller, *Victorian Expedition*.

Victoria. N.W. districts, L. Morton.

S. Australia. Head of the Great Bight, Delisser; Fowler's Bay, R. Brown.

The species has not the style of *Olearia*, and there are no female florets. I also found the anthers quite free in all the flowers I examined, but that may not be constantly the case. Notwithstanding these anomalies, as I know of no genus to which it is more nearly allied, I have left it in *Olearia* as described by F. Mueller.

SECTION IV. ADENOTRICHE, *Archer*.—Plant glabrous, usually glutinous. Involucre ovoid turbinate or rarely hemispherical, the bracts usually obtuse, rigid, scarious on the margins and often ciliate, more imbricate than in *Merismotriche*.

38. **O. magniflora**, F. Muell. *Fragm.* v. 80. A shrub of 3 or 4 ft., with divaricate branches, the whole plant glabrous and often glutinous. Leaves not numerous, narrow, ciliate, thick, obtuse and often 3-toothed at

the end, the larger ones above $\frac{1}{2}$ in. long, but mostly smaller. Flower-heads large, solitary, terminal. Involucre broadly turbinate, $\frac{1}{2}$ in. diameter, the bracts numerous, much imbricate, the inner ones often coloured on the margins. Ray-florets 15 to 20, long and narrow; disk-florets numerous. Style-lobes long, with short obtuse appendages. Achenes long, glabrous. Pappus exceeding the involucre, a few of the outer bristles shorter than the others.—*Aster magniflorus*, F. Muell. l. c.

N. S. Wales. Desert of the Murray, Darling, and Murrumbidgee, F. Mueller and others; towards Lachlan river, *Burkitt*.

Victoria. Desert of the N.W., L. Morton, F. Mueller.

39. **O. calcarea**, F. Muell. *Herb.* A compact much-branched shrub, more or less glutinous, otherwise glabrous. Leaves obovate or broadly cuneate, thick, more or less toothed, not above $\frac{1}{2}$ in. long in the specimen seen. Flower-heads solitary, terminal, nearly as large as in *O. magniflora*. Involucre broadly turbinate, the inner bracts 7 to 8 lines long, often coloured. Style-appendage long and pointed. Achenes silky-hairy. Pappus with a few of the outer bristles rather shorter than the others.

S. Australia. Towards Cudnaka and banks of the Murray near Moorundi, F. Mueller. (*Herb. F. Mueller*). The species appears to be quite distinct, but requires further elucidation from more complete specimens.

40. **O. Muelleri**, Benth. A much-branched bushy shrub, more or less glutinous, otherwise glabrous. Leaves obovate or broadly cuneate, thick, very obtuse, entire or toothed, under $\frac{1}{2}$ in. long, narrowed into a petiole. Flower-heads solitary, terminal, much smaller than in *O. magniflora*. Involucre ovoid or turbinate, much imbricate, the inner bracts about 4 lines long. Ray-florets 8 to 10; disk-florets more numerous. Style-appendages short as in *O. magniflora*. Achenes silky-hairy, much shorter than in the last two species, and the pappus with fewer bristles.—*Eurybia Muelleri*, Sond. in *Linnaea*, xxv. 459.

N. S. Wales. Darling river, *Victoria Expedition*; desert of the Murray and Murrumbidgee, F. Mueller.

Victoria. Avoca river, F. Mueller; Wimmera, *Dallachy*; N.W. districts, L. Morton.

S. Australia. South coast, R. Brown; Flinders' Range, F. Mueller; Lake Gairdner, *Babbage*; Northern interior, M'Donnell Stuart's *Expedition*.

W. Australia. *Drummond*, with rather smaller flower-heads, but apparently not otherwise different.

41. **O. Stuartii**, F. Muell. *Fragm.* v. 76. Apparently a divaricately-branched small shrub, densely glandular-viscid, otherwise glabrous. Leaves cuneate-oblong or almost linear, obtuse and obtusely toothed, $\frac{1}{2}$ to 1 in. long, narrowed into a petiole. Flower-heads terminal, shortly pedunculate, broadly ovoid or almost hemispherical. Involucral bracts much imbricate, more acute than in the other species of this section. Achenes slightly hairy. Pappus rather unequal.—*Eurybia Stuartii*, F. Muell. *Fragm.* i. 202; *Aster Stuartii*, F. Muell. *Fragm.* v. 76.

S. Australia. N.W. of Lake Gairdner, M'Donnell Stuart. The species might perhaps be transferred to the following section, but requires further elucidation from more perfect specimens.

42. **O. decurrens**, Benth. A tall shrub, glabrous and viscid. Leaves

usually distant, linear-oblong, obtuse, entire or with a few coarse teeth or on barren shoots cuneate and lobed, mostly $\frac{1}{2}$ to 1 in. long. Flower-heads small, in a loose leafy panicle or almost solitary. Involucre ovoid-turbinate, imbricate, the inner bracts about 3 lines long. Ray-florets 6 to 8; disk-florets slightly exceeding the involucre. Style-branches rather long, but with short lanceolate appendages. Achenes silky-hairy. Pappus-bristles unequal.—*Eurybia decurrens*, DC. Prod. v. 269.

N. S. Wales. Lachlan river, *A. Cunningham*; Darling and Murray desc., *Victorian Expedition* and others.

S. Australia. Port Lincoln, *R. Brown, Wilhelmi*; Spencer's Gulf, *F. Mueller*.

43. *O. glutinosa*, *Benth.* A bushy shrub of 3 to 5 ft., very glutinous, but otherwise glabrous. Leaves narrow-linear, acute or obtuse, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, flat or the margins slightly recurved. Flower-heads small, in terminal corymbs, not pedunculate although at first prominent above the last leaves, and the lateral leafy branches often growing out much beyond the inflorescence. Involucres larger and more ovoid than in *O. glandulosa*, the inner bracts above 2 lines long. Ray-florets about 6 to 10; disk-florets scarcely exceeding the involucre. Anthers much exerted. Style-appendages short. Achenes glabrous or sparingly hairy. Pappus-bristles unequal.—*Eurybia glutinosa*, Lindl. Bot. Reg. 1839, Misc. 68; *E. linifolia*, Hook. f. in Hook. Lond. Journ. vi. 109, and Fl. Tasm. i. 179; *E. glutescens*, Sond. in Linnæa, xxv. 462; *Aster glutescens* or *Olearia glutescens*, F. Muell. Fragm. v. 77; *Aster orarius* or *Olearia oraria*, F. Muell. Fragm. v. 78 (in an older state).

Victoria. Port Phillip, *R. Brown*; from the mouth of the Glenelg to Wilson's Promontory, *F. Mueller* and others.

Tasmania. Sandy seacoasts in the northern parts of the island and in the islands of Bass's Straits, *J. D. Hooker* and others.

S. Australia. Murray river near Moorundi and Lofty Ranges, *Wilhelmi*; Lake Victoria and Port Gawler, *F. Mueller*.

44. *O. passerinoides*, *Benth.* A bushy shrub of 1 to 2 ft., glabrous and glutinous. Leaves crowded, linear, erect, obtuse, with somewhat revolute margins, but the broad midrib exposed, mostly 2 to 3 lines long. Flower-heads small, sessile within the last leaves. Involucres ovoid, the inner bracts about $2\frac{1}{2}$ lines long. Ray-florets about 6 to 8; disk-florets rather more numerous, not exceeding the involucre. Style-appendages short. Achenes short, hairy. Pappus-bristles unequal.—*Diptopappus passerinoides*, Turcz. in Bull. Mosc. 1851. ii. 63; *Aster vernicosus* or *Olearia vernicosa*, F. Muell. Fragm. v. 67.

W. Australia. *Drummond*, 5th Coll. n. 371; sandy plains, Middle Mount Barren, Eyre and Phillips ranges, *Maxwell*. The species is very near *O. Hookeri*, and chiefly differs in its erect leaves. Some small-leaved scarcely hispid specimens of *O. muricata* come near to *O. passerinoides*, but may be at once known by their leaves with prominent revolute margins, leaving only a narrow furrow between them, and the involucres are broader with more acute bracts.

45. *O. teretifolia*, *F. Muell. Fragm.* v. 77. A bushy shrub of 2 to 5 ft., glabrous and viscid. Leaves linear, erect, closely appressed, obtuse, the margins closely revolute so as to be nearly terete, usually not exceeding 1 line on the flowering branches, looser and often 2 lines long on barren ones. Flower-heads small, terminal, sessile. Involucre ovoid, not 2 lines long.

Ray-florets 3 or 4; disk-florets 4 to 6. Achenes glabrous or hairy. Pappus-bristles unequal, not numerous. *Eurybia teretifolia*, Sond. in *Linnaea*, xxv. 464; *Aster teretifolius*, F. Muell. *Fragm.* v. 77.

S. Australia. Stony declivities between Adelaide and Liffy ranges, F. Mueller. Kangaroo Island, *Waterhouse*.

Var. with rather larger flower-heads.

N. S. Wales. Darling desert, *Herb. F. Mueller*.

The species differs slightly from *O. passeranthes* and *O. Hookeri* in its small erect leaves, and may possibly be a variety of the latter.

46. *O. Hookeri*, *Benth.* A much-branched shrub, glabrous and glutinous. Leaves numerous, linear, spreading or recurved, obtuse, with revolute margins, mostly 2 to 3 lines long. Flower-heads small, terminal, sessile. Involucre ovoid, the inner bracts about $2\frac{1}{2}$ lines long. Ray-florets about 6 to 8; disk-florets rather more numerous, not exceeding the involucre. Style-appendages short. Achenes short, hairy. Pappus unequal. — *Eurybia ericoides*, Hook. f. *Fl. Tasm.* i. 180, not of Steetz; *Eurybia Hookeri*, Sond. in *Linnaea*, xxv. 463.

Tasmania. Near Hobarton, *Lyall*, *Gunn*, and others. A specimen from Great Swan Port, referred here by Hooker, has the leaves much shorter and the flower-heads more hemispherical like those of *O. imbricata*.

Var. ? *microcephala*. Leaves very small, but spreading or recurved. Flower-heads small.

Victoria. Murray river, *Dallachy*.

47. *O. imbricata*, *Benth.* A shrub of 1 to 2 ft., with erect or divaricate branches, glabrous and sometimes slightly glutinous. Leaves numerous, linear-cuneate, obtuse, thick, 1 to 2 or rarely 3 lines long, erect or spreading. Flower-heads terminal, shortly pedunculate. Involucre hemispherical, the inner bracts almost acute, $2\frac{1}{2}$ lines long. Ray-florets 15 to 20. Achenes short, hairy. Pappus-bristles not numerous, a few outer ones short. — *Eurybia imbricata*, Turcz. in *Bull. Mosc.* 1851, ii. 61; *Aster Turczaninowii* or *Olearia Turczaninowii*, F. Muell. *Fragm.* v. 67.

W. Australia. *Leamond*, 5th Cell. n. 379; broken country near Oldfield river, Phillips river, valleys near Eyre's Range, *Maxwell*.

48. *O. elliptica*, *DC. Prodr.* v. 271. A tall shrub, glabrous and often glutinous, the foliage sprinkled with minute glandular dots. Leaves elliptical, oblong or lanceolate, acute acuminate or almost obtuse, entire or rarely sinuate-toothed, narrowed at the base, $1\frac{1}{2}$ to 3 in. long. Flower-heads small, numerous, in a terminal corymbose, leafless panicle. Involucre broadly ovoid or almost hemispherical, 3 to 4 lines diameter. Ray-florets 6 to 8; disk-florets rather more numerous. Style-appendages rather long. Achenes slightly hairy. Pappus with few or many outer short bristles. *Eurybia illita*, F. Muell. *Fragm.* i. 16; *Aster illita* or *Olearia illita*, F. Muell. *Fragm.* v. 76.

Queensland. Near Warwick, *Beckler*.

N. S. Wales. New England, *C. Stuart*; Mount Lindsay, *W. Hill*; Illawarra, *A. Cunningham*.

49. *O. glandulosa*, *Benth.* An undershrub or shrub attaining 3 or 4 ft., quite glabrous but more or less glandular-dotted, the branches slender and erect. Leaves very narrow-linear, acute, with closely revolute margins

so as to appear terete, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long. Flower-heads small, in terminal corymbose leafless panicles. Involucre almost hemispherical, about 3 lines diameter, the bracts narrow, in few rows, the inner ones scarcely $1\frac{1}{2}$ lines long. Ray-florets 12 to 15; disk-florets scarcely exceeding the involucre. Style-appendages short and obtuse. Achenes small, silky-hairy. Pappus-bristles unequal, not very numerous.—*Aster glandulosus*, Labill. Pl. Nov. Holl. ii. 50, t. 197; *Galatella glandulosa*, Nees, Gen. et Sp. Ast. 174; *Eurybia glandulosa*, DC. Prod. v. 269; Hook. f. Fl. Tasm. i. 179.

N. S. Wales. Marshy lands south of Lake George, *A. Cunningham*.

Victoria. Marshy places, Dandenong ranges, Delatite river, *F. Mueller*: near Creswick, *Whan*.

Tasmania. Port Dalrymple, *R. Brown*; abundant on marshy river-banks throughout the colony, ascending to 3500 feet, *J. D. Hooker*.

S. Australia. S. coast, *R. Brown*, *Whittaker*.

SECTION V. MERISMOTRICHE, *Archer*.—Glabrous, glandular-pubescent or hirsute with simple rigid white or transparent hairs, transversely septate and often glutinous. Involucre hemispherical, with narrow usually acute bracts. Leaves alternate. Anthers not auriculate.

The last four species of this section come near to some species of *Vittadinia*, but have much fewer ray-florets, the style appendages are shorter, and the achenes less compressed.

50. **O. helecophila**, *F. Muell. Fragm.* v. 66. A shrub or undershrub with slender virgate branches, glabrous glandular-pubescent or sometimes with a little wool about the involucre. Leaves narrow-linear, acute or obtuse, with revolute margins, in some specimens mostly under $\frac{1}{2}$ in. long and distant, in others the lower ones 1 to $1\frac{1}{2}$ in. and much crowded. Flower-heads small, forming an irregular loose panicle or corymb. Involucre ovoid-turbinate or at length almost hemispherical, the bracts narrow, acute or rather obtuse, the inner ones about 2 lines long. Ray-florets about 12 to 15; disk-florets scarcely longer than the involucre. Style-appendages short. Achenes small, silky-hairy. Pappus-bristles not very numerous, several of the outer ones short.—*Eurybia helecophila*, DC. Prod. v. 269; *Aster helecophilus*, *F. Muell. Fragm.* v. 66; *Eurybia affinis*, Steetz in Pl. Preiss. i. 421; *E. paniculata*, Steetz, l. c. 422; *Aster Preissii*, *F. Muell. Fragm.* v. 66.

W. Australia, *Druce*, *Monat.* 2nd Coll. n. 173; King George's Sound, *A. Cunningham*; near Guildford and Illy river, *Preiss*, n. 80 and 81.

Var. major. More woolly; lower leaves rather broader, occasionally toothed; flower-heads larger.—*Eurybia Lehmanniana*, Steetz in Pl. Preiss. i. 422; *Aster Lehmanni*, *F. Muell. Fragm.* v. 66.—Swan River, *Preiss*, n. 79.

51. **O. muricata**, *Benth*. A divaricately-branched shrub of 1 to 2 ft., glabrous glandular-pubescent or almost muricate with short rigid hairs and occasionally with a little of the wool of *Eriotriche* about the peduncles. Leaves linear, very obtuse, with closely revolute margins, mostly 2 to 4 lines long. Flower-heads shortly pedunculate, rather small. Involucre from narrow turbinate to almost hemispherical, with narrow bracts. Ray-florets about 8 to 10; disk-florets rather more numerous. Style-appendages short but almost acute. Achenes hairy. Pappus with a few outer short bristles.—*Eurybia muricata*, Steetz in Pl. Preiss. i. 423; *Aster muricatus*, *F. Muell. Fragm.* v. 66.

W. Australia. Near Cape Rache, *Preiss.* n. 82, *Hareng.* Apparently a variable species, difficult to distinguish on the one hand from *O. adcolata* and on the other from *O. heliophila*, and some glabrous specimens coming even near to *O. imbricata*. Amongst numerous specimens of Drummond's, we should probably refer to *O. mucicata*, n. 77, 85, 3rd Coll. n. 127 (which is *Borophia leptophylla*, Tacz. in Bull. Mosc. 1851, i. n. 171), and perhaps also 5th Coll. n. 384, the latter, however, possibly a form of *O. imbricata*.

52. ***O. strigosa*, Benth.** An erect, sparingly-branched undershrub of 1 to 3 ft., more or less hispid with short septate hairs intermixed with a slight glandular pubescence. Leaves linear, mucronate-acute, with revolute margins, often almost mucronate. Flower-heads larger than in the last two species, more or less pedunculate, the upper leaves gradually reduced almost to bracts. Involucre hemispherical, nearly $\frac{1}{2}$ in. diameter, the inner bracts about 3 lines long, rather acute. Ray-florets about 8 to 12; disk-florets scarcely exceeding the involucre. Achenes silky-hairy. Pappus unequal.—*Eurybia strigosa*, Steetz in Pl. Preiss. i. 419; *E. aspera*, Steetz, l. c. 420; *Aster Steetzii* or *Olearia Steetzii*, F. Muell. Fragm. v. 66.

W. Australia. Vasse river, *Preiss.* n. 83, also a single specimen, without the locality given, in Maxwell's collection. The species appears to be very nearly allied to the last two.

53. ***O. paucidentata*, F. Muell. Fragm. v. 66.** An undershrub or shrub of 2 to 3 ft., scabrous-pubescent or hispid with short septate hairs and often somewhat viscid. Leaves oblong-linear or oblanceolate and $\frac{1}{2}$ to 1 in. long or shorter and obovate, obtuse, narrowed into a petiole, with 1 or 2 prominent teeth or lobes on each side or occasionally entire, the margins usually recurved. Flower-heads rather small, on peduncles usually longer than the leaves, forming a terminal leafy panicle. Involucre hemispherical, the bracts narrow, almost acute, the inner ones about 2 lines or in large heads $2\frac{1}{2}$ lines long. Ray-florets 12 to 20; disk-florets more numerous, scarcely exceeding the involucre. Style-appendages short. Achenes pubescent. Pappus rather short, slightly unequal, with sometimes a very few short outer bristles.—*Eurybia paucidentata*, Steetz in Pl. Preiss. i. 420; *Aster paucidentatus*, F. Muell. Fragm. v. 66.

W. Australia. Swan River, *Drummond*, 1st Coll. also n. 31, 34, and 4th Coll. n. 128; *Preiss.* n. 74, 84, and n. 80 in part; Franklin and Blackwood rivers, *Oldfield*.

Var. *latifolia*, *Drummond*, 2nd Coll. n. 172; Plantagenet and Stirling ranges, *Maxwell*.

The species varies much in the breadth of the leaf, the more or less copious indumentum, and in the size of the flower-heads.

54. ***O. stricta*, Benth.** An erect undershrub or shrub, of 1 to 3 ft., not much branched, very glandular-pubescent and hirsute with short septate hairs. Leaves linear, flat or with recurved margins, not exceeding $\frac{1}{2}$ in., often clustered in the axils. Flower-heads terminating short, lateral branches, and sessile within the last leaves, forming a long, narrow, leafy panicle. Involucre hemispherical, with narrow, herbaceous, acute bracts, the inner ones nearly 3 lines long. Ray-florets 12 to 15; disk-florets not longer than the involucre. Achenes short, pubescent. Pappus of nearly equal bristles, with an outer row of short ones.

Victoria. Rocks of Mount Aberdeen, Buffalo Range, at an elevation of 4000 ft., *F. Mueller*.

55. *O. tenuifolia*, *Benth.* A shrub of 3 to 4 ft., often scabrous or glutinous, with glandular papillæ or very short rigid hairs, otherwise glabrous. Leaves narrow-linear, acute or almost obtuse, $\frac{1}{2}$ to 1 in. long, the margins usually revolute. Flower-heads much larger and fewer than in *O. glandulosa*, which the species resembles in foliage, all pedunculate, irregularly corymbose. Involucre nearly hemispherical, the outer bracts with herbaceous lanceolate, but appressed tips, the inner ones dry, nearly 3 lines long. Ray-florets 10 to 15; disk-florets not much exceeding the involucre. Style-appendages short. Achenes more or less hairy. Pappus unequal, the outer bristles sometimes quite short.—*Eurybia tenuifolia*, DC. Prod. v. 269.

N. S. Wales. Rocky Callitris Ranges, S. of Liverpool plains, and brushes near Bathurst, and other sterile broken plains in the interior, *A. Cunningham, Fraser*.

56. *O. adenophora*, *F. Muell. Fragm.* v. 78. A shrub, attaining several feet, very viscid and scabrous, with a glandular pubescence intermixed with articulate hairs. Leaves rather crowded, linear, obtuse, entire, with revolute margins, mostly above 1 in. long. Flower-heads rather large, on peduncles shorter than the leaves, solitary or few in a short corymb. Involucre hemispherical, the bracts numerous, acute, the inner ones above 3 lines long, the outer ones gradually shorter. Ray-florets above 20; disk-florets numerous, rather longer than the involucre. Style-appendages very short and obtuse. Achenes silky-hairy. Pappus with an outer row of numerous short bristles.—*Eurybia adenophora*, F. Muell. Fragm. i. 111; *Aster adenophorus*, F. Muell. Fragm. v. 78.

Victoria. Maintains on M'Alister river, at an elevation of 2600 to 3000 ft., *F. Mueller*.

57. *O. homolepis*, *F. Muell. Fragm.* v. 65. A shrub, of 3 or 4 ft., with stout, erect, virgate branches, very scabrous with short, rigid hairs. Leaves crowded, linear, mucronate-acute or obtuse, with revolute margins, $\frac{1}{2}$ to 1 in. long, very scabrous or almost mucronate. Flower-heads large, solitary or 2 or 3 together at the ends of the branches, on peduncles shorter than the leaves. Involucre hemispherical, the bracts narrow, the inner ones 5 lines long, the outer ones often scarcely shorter. Ray-florets above 20; disk-florets numerous, scarcely exceeding the involucre. Achenes silky-hairy. Pappus bristles nearly equal, with a few outer short ones.—*Aster homolepis*, F. Muell. l. c.

W. Australia. Murchison river, *Oldfield, Drummond, 6th Coll. n. 151.*

58. *O. xerophila*, *F. Muell. Fragm.* v. 76. A shrub, very glutinous and hispid with septate hairs. Leaves from obovate to oblong, obtuse, crenately toothed and almost crisped, narrowed into a petiole, $\frac{1}{4}$ to 1 in. long. Flower-heads not very large, on axillary peduncles longer than the leaves, solitary or few in a loose corymb. Involucre hemispherical, the bracts narrow, acute, in several rows, the inner ones about 2 lines long. Ray-florets 12 to 15; disk-florets numerous, much longer than the involucre. Style-appendages lanceolate. Achenes silky-pubescent. Pappus sometimes very unequal, a few outer bristles quite short, more rarely all nearly equal.—*Eurybia xerophila*, F. Muell. Fragm. i. 51; *Aster xerophilus*, F. Muell. Fragm. v. 76; *A. Heynei*, F. Muell. Fragm. v. 86.





Eurybia ferresii. *FM*

Queensland. Barren ridges, Upper Burdekin river, *F. Mueller*; Cape river, *B. Man.*

59. **O. Ferresii**, *F. Muell. Fragm.* v. 75. Shrubby, glabrous, except a very few loose hairs about the involucre. Leaves broadly lanceolate, acute, slightly and remotely toothed, narrowed into a petiole, 3 to 4 in. long, green on both sides and not scabrous. Flower-heads large, few in a terminal corymb, the peduncle as long as the leaves, with a few subulate bracts. Involucre hemispherical, slightly glandular, the bracts narrow, mostly acute, in several rows, the inner ones about 4 lines long, the outer ones gradually shorter. Ray-florets about 20, narrow; disk-florets very numerous, much longer than the involucre. Achenes silky. Pappus unequal, but with few very short bristles. — *Erythra Ferresii*, *F. Muell. Fragm.* iii. 18, t. 18; *Aster Ferresii*, *F. Muell. Fragm.* v. 75.

N. Australia. Brindley's Bluff, near McDonnell Ranges, *M. Doodie Stuart's Expedition.* A single specimen with the flowers scarcely expanded (*Herb. F. Mueller*).

60. **O. rudis**, *F. Muell. Fragm.* v. 75. An erect shrub or undershrub, more or less scabrous or hirsute with rigid septate hairs or rarely nearly glabrous. Leaves obovate-oblong, oblong-cuneate or broadly lanceolate, obtuse or rarely acute, coarsely and irregularly toothed or nearly entire, mostly 1 to 2 in. long, usually contracted below the middle, but often broader and stem-clasping at the base. Flower-heads rather large, solitary or few together in a terminal corymb, the peduncles longer than the leaves, thickened under the head, without any or only a single linear bract. Involucre hemispherical, the bracts narrow, mostly acute, the inner ones about 4 lines long, the outer scarcely shorter. Ray-florets narrow, numerous; disk-florets scarcely so long as the involucre. Style-appendages very short. Achenes glabrous or nearly so, slightly compressed, strongly striate. Pappus-bristles nearly equal. — *Erythra rudis*, Benth. in Huag. Enum. 58; Steetz in Pl. Preiss. i. 418; *Aster exul*, Lindl. Swan Riv. App. 24; *F. Muell. Fragm.* v. 75.

W. Australia. Swan River, *Huegel, Drummond, 1st Coll., also n. 35, 39, 181, 385; Preiss, n. 63, and others.*

Var. *scabra*. Very scabrous and hispid. Leaves oblong-cuneate, rarely exceeding 1 in. on the flowering branches. Flower-heads rather smaller. — *Erythra scabra*, Benth. in Huag. Enum. 58.

N. S. Wales. Murray desert, near the Murrumbidgee. *F. Mueller.*

Victoria. Wimmera, *Dallachy.*

S. Australia. Memory Cove, *R. Brown*. Vines and Streaky Bays, *Babbage, Warburton.*

Var. *glabriuscula*. Leaves usually large, obovate-oblong, scabrous, but appearing glabrous. Wimmera, *Dallachy*; Gawler Town, Rivol. Bay, etc., in S. Australia, *F. Mueller.*

61. **O. picridifolia**, Benth. An erect shrub, with the rigid pubescence, inflorescence and flower-heads of *O. rudis*, of which *F. Mueller* now thinks it may be a variety, but the leaves are all very narrow-lanceolate or linear, narrowed at the base and quite entire, a form to which I have seen no approach in any of the varieties of *O. rudis*. — *Erythra picridifolia*, *F. Muell. in Linnaea*, xxv. 397.

S. Australia. Barren hills towards Lake Torrens, *F. Mueller.*

62. **O. arguta**, Benth. A shrub or undershrub, of 1 to 2 ft., more or

less hirsute with septate hairs and somewhat glutinous. Leaves oblong-lanceolate, acute, entire or with a few pointed teeth towards the end, narrowed below the middle, but broad and stem-clasping at the base, 2 to 4 in. long. Flower-heads rather large, solitary, on peduncles longer than the leaves, with 1 or 2 small bracts. Involucre nearly hemispherical, the bracts narrow, acute, the inner ones 4 to 5 lines long, the outer ones shorter. Ray-florets numerous; disk-florets not longer than the involucre. Achenes pubescent. Pappus-bristles nearly equal.—*Aster argutus*, R. Br. Herb.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

Var. *lanata*. Young leaves clothed with a dense white deciduous wool, and mostly quite entire.—Arnhem, N. and S. bays, *R. Brown*.

This species is certainly nearly allied in essential characters to *O. rudis*, but the aspect of the specimens is very different, and the stations of the two are widely distant.

63. **O. ciliata**, *F. Muell. Fragm.* v. 79. An undershrub or small shrub, not exceeding 1 ft. without the peduncles, the branches glabrous or with a few septate hairs. Leaves crowded, spreading, linear, rigid, mucronate-acute or almost obtuse, mostly $\frac{1}{2}$ to $\frac{3}{4}$ in., but sometimes above 1 in. long, the margins revolute and usually ciliate, otherwise glabrous or rarely scabrous-pubescent. Flower-heads rather large, on terminal peduncles, often 4 or 5 in. long. Involucre hemispherical, the bracts narrow, acute, glabrous or ciliate, the inner ones nearly 4 lines long, the outer ones gradually shorter. Ray-florets 15 to 20; disk-florets numerous, scarcely exceeding the involucre. Style-appendages short. Achenes glabrous or silky-pubescent. Pappus-bristles nearly equal, with occasionally a few outer very short ones. —*Eurybia ciliata*, Benth. in Hueg. Enum. 58; Steetz in Pl. Preiss. i. 418; Hook. f. Fl. Tasm. i. 180; *Aster Huegelii*, F. Muell. Fragm. v. 79.

Victoria. Murray desert, *F. Mueller*; Wimmera, *Dallachy*; Mount Abrupt, *Wilhelm*; Wilson's Promontory, *F. Mueller*.

Tasmania. S. Esk river, *Gunn*; near Swanport, *C. Stuart*.

S. Australia. S. coast, *R. Brown*; Lofty Range, Spencer's Gulf, etc., *F. Mueller* and others.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Huegel*, *Drummond*, n. 19, 5th Coll. n. 375; *Preiss*, n. 76, 77, 78; Cape Naturaliste, *Oldfield*.

Var. *hispida*. Leaves very hispid, the longer ones occasionally 3-toothed.—Hike's Place, S. Australia, *F. Mueller*.

Var. *squamifolia*, *F. Muell.* Leaves densely crowded, 1 to 2 lines long, entire or 3-lobed. Flower-heads much smaller.—Kangaroo Island, *Waterhouse*.

12. CELMISIA, Cass.

Involucre broadly hemispherical, the bracts imbricate, in several rows, the margins dry or scarious, without herbaceous tips. Receptacle pitted, without scales. Florets of the ray female, in a single row, ligulate, spreading. Disk-florets numerous, hermaphrodite, tubular, 5-lobed. Anthers with acute or pointed auricles at the base. Style-branches flattened, with rather long tips or appendages, papillose on the back. Achenes slightly compressed, with 2 or 3 prominent nerves on each side. Pappus of numerous unequal capillary bristles. Perennial herbs, more or less silvery-silky. Leaves chiefly radical, narrow, entire. Scapes nearly leafless, bearing a single large flower-head.

The genus comprises but few species, natives of the Antarctic regions and New Zealand; the single Australian species being the same as one of the New Zealand ones. It is closely allied to some of the mountain species of *Aster*, differing chiefly in the anthers not obtuse at the base. From *Olearia* it is chiefly distinguished by its habit and longer style-appendages.

1. ***C. longifolia***, *Cuss.* ; *DC. Prodr.* v. 209. A perennial, with a densely tufted stock, forming often large silvery-white patches. Radical leaves linear or rarely linear-lanceolate, with a broad sheathing base, softly mucronate or obtuse, the margins revolute, varying in length from barely 2 in. in some specimens to 8 or 10 in. in others, densely white tomentose underneath, the silvery-silky indumentum of the upper surface often deciduous, leaving the old leaves glabrous and shining above. Scapes always exceeding the leaves, and attaining sometimes $1\frac{1}{2}$ ft., the leaves all reduced to linear or lanceolate bracts, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long. Involucre broadly turbinate or hemispherical, woolly or at length glabrous, the inner bracts $\frac{1}{2}$ in. long. Ray-florets above 30, pink or white; disk-florets about as long as the involucre. Achenes fully 3 lines long, more or less silky pubescent. Pappus-bristles very unequal, the shortest half as long as the longest.—*Gaud.* in *Freye. Voy.* 470. t. 91; *Hook. f. Fl. Tasm.* i. 181; *Hando. N. Zeal. Fl.* 134; *C. asteliifolia*, *Hook. f. Fl. Ant.* i. 35; *Aster Celmisia*, *F. Muell. Fragm.* v. 84.

N. S. Wales. Bogs of the Blue Mountains, *A. Cunningham* and others.

Victoria. Australian Alps, at an elevation of 4000 to 5000 ft., and summit of Mount William, in the Grampians, *F. Mueller*.

Tasmania. Derwent river, *R. Brown*; frequent in bogs on the summits of the mountains, at an elevation of 3000 to 5000 ft., *J. D. Hooker*.

The species is also in New Zealand.

Var. ? *latifolia*, *F. Muell.* Leaves 8 in. to 1 ft. long, $\frac{3}{4}$ to $1\frac{1}{2}$ in. wide, narrowed below the middle, the margins not recurved.—High Alpine ranges on the McAlister river, Haidinger Range and Mount Baller, *F. Mueller*. A specimen from Mount Barkly appears to connect this with the common narrow-leaved form.

Var. ? *saxifraga*. Very small in all its parts. Stock usually branching and elongated to 1 to 3 in., covered with the remains of old leaves. Leaves in a dense tuft, narrow-linear, with revolute margins, under 1 in. long. Scapes 1 to 3 in. long. Flower-heads, florets, and achenes much smaller than in the common *C. longifolia*.—Table Mountain, Derwent river, *R. Brown*; summit of Mount Lapeyrouse, *Oldfield*.

13. VITTADINIA, A. Rich.

(*Microgyne*, *Less.*; *Eurybiopsis*, *DC.*)

Involucre hemispherical or campanulate, the bracts imbricate in several rows, with dry or scarious margins, without herbaceous tips, in the Australian species narrow and mostly acute. Receptacle pitted, without scales. Florets of the ray female numerous and crowded, so as to form more than one row, ligulate and spreading in the Australian species. Disk-florets numerous, but often not so many as those of the ray, hermaphrodite, tubular, dilated upwards, usually 5-lobed. Anthers obtuse at the base. Style-lobes somewhat flattened, with subulate tips or appendages papillose on the back. Achenes narrow, compressed or flat, with or without ribs on the faces. Pappus of numerous often unequal capillary bristles.—Perennial herbs or undershrubs, at length woody at the base, or in species not Australian shrubs. Leaves

alternate. Flower-heads terminal, solitary or forming loose leafy corymbs. Ray-florets white or blue. Disk-florets yellow.

The genus extends to New Zealand and extratropical S. America, and (in a slightly modified form) to the Sandwich Islands. Of the 4 Australian species one is also in New Zealand, and very closely allied to the S. American one; the others are endemic. As a genus, the group is nearly allied to *Eurybia*, *Aster*, and especially to *Erigeron*, but, as shown by A. Gray (Proc. Amer. Acad. v. 116), it cannot well be united with either. From *Eurybia* it differs in the more numerous ray-florets and the more flattened achenes, from *Erigeron* in habit, and from both in the subulate tips to the styles.

SECTION I. *Vittadinia vera*.—Achenes with 2 or more ribs on each face.

Involucre imbricate in several rows. Achenes shorter than the involucre, with 2 or 3 ribs on each face. Pappus not so long. . . . 1. *V. brachycomoides*.
Involucre of 2 or 3 rows. Achenes nearly as long as the involucre, many-ribbed or finely striate. Pappus as long again 2. *V. australis*.

SECTION II. *Eurybiopsis*. Achenes very flat, the margins slightly thickened, without prominent ribs on the faces.

Scabrous-pubescent or hirsute. Leaves oblong or cuneate. Ray-florets scarcely exceeding the pappus 3. *V. scabra*.
Glabrous or scabrous-pubescent. Leaves linear or the lower ones linear-cuneate. Ray-florets longer than the pappus 4. *V. macrorrhiza*.

SECTION I. *VITTADINIA VERA*, A. Gray.—Achenes with 2 or more ribs on each face.

1. ***V. brachycomoides*, F. Muell. Fragm. v. 86, as an *Aster*.** Stems from a thick woody stock, erect or decumbent, not much branched, $\frac{1}{2}$ to $1\frac{1}{2}$ ft. long, with more or less of a loose white woolly deciduous tomentum. Leaves in the original form linear or lanceolate, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, entire or rarely 3-toothed at the end. Flower-heads on long terminal peduncles. Involucre hemispherical, the bracts in several rows, the inner ones $2\frac{1}{2}$ to 3 lines long, the outer ones gradually shorter. Ray-florets narrow, elongated, spreading. Achenes narrow, much shorter than the involucre, flat, with 2 or 3 prominent ribs on each face. Pappus of fine white rather unequal and not very copious bristles, not so long as the achene.

N. Australia. Boskile plain, Hooker and Stuart's Creek and Arnhem's Land, F. Mueller.

Queensland. Postard Bay, *Beckes and Schlander*; Keppel Bay, R. Brown, *Thozet*; Percy Island, M'Gillivray; Rockhampton, Dallachy.

Var. (?) *latifolia*. Leaves broader, oblong, entire or toothed. Involucral scales broader and fewer.—Endeavour river and Northumberland Islands, R. Brown (the former specimens nearly glabrous, the latter very woolly); Albany Island, Cape York, M'Gillivray; Rockingham Bay, Dallachy; E. coast, A. Cunningham, Bowman; also Purdie's River in the interior of N. Australia, M'Donnell Stuart's Expedition.—Possibly a distinct species.

2. ***V. australis*, A. Rich.; DC. Prod. v. 280.** Herbaceous, either erect and apparently annual (flowering the first year?) or with diffuse or ascending stems from a woody base, rarely above 1 ft. high, more or less tomentose, with soft almost silky or woolly hairs, or scabrous-hispid with rigid hairs arising from a tubercle. Leaves in the typical form from obovate or spatulate to linear-cuneate, entire or coarsely 3-toothed or lobed, narrowed

into a petiole, under $\frac{1}{2}$ in. long when broad, sometimes above 1 in. when narrow. Flower-heads solitary, terminal. Involucre of 2 or 3 rows of narrow bracts 3 to 4 lines long, or the outer row shorter. Ray-florets narrow, about as long as the pappus or rather longer, but usually revolute so as to appear much shorter; disk-florets slender, much longer than the involucre. Achenes narrow, nearly as long as the involucre, tapering at the base, more or less pubescent, striate with 6 to 8 fine ribs on each face. Pappus longer than the achene, of copious rather unequal brownish bristles, a few outer ones much shorter.—*Aster Behrii*, Schlecht. *Linnaea*, xxi. 446; F. Muell. *Fragm.* v. 87; *Vittadinia triloba*, *V. cuneata*, and probably also *V. dentata*, DC. *Prod.* v. 281; *Eurybiopsis scabrata* and *E. gracilis*, Hook. f. in Hook. *Lond. Journ.* vi. 110; *E. Hookeri*, F. Muell. in *Linnaea*, xxv. 453; *Vittadinia scabra* and *V. cuneata*, Hook. f. *Fl. Tasm.* i. 181, 182; *V. triloba*, *V. cuneata*, and *V. scabra*, A. Gray in *Proc. Amer. Acad.* v. 118; *Diplopappus australasicus*, Turcz. in *Bull. Mosc.* 1851, i. 171.

Queensland. Bustard Bay and Bay of Islands, *Banks and Solander*; Keppel Bay, *Thozet*; Port Curtis, *McGillivray* (the achenes in these specimens not so prominently striate but very different from those of *V. scabra*).

N. S. Wales. Port Jackson and Hunter's River, *R. Brown*; Clarence river, *Bell*; Lachlan river, *A. Cunningham*; Darling and Murray desert, and towards the Barrier Range, *Victorian and other Expeditions*.

Victoria. Common in dry open declivities from Lake King, in Gipps' Land, to the western frontier, in the Murray desert, Wimmera, etc., *F. Mueller* and others.

Tasmania. Derwent river, *R. Brown*; in dry stony places, frequent, *J. D. Hooker* and others.

S. Australia. From the Murray river to St. Vincent's and Spencer's gulfs, *F. Mueller* and others.

W. Australia. From the S. coast to Swan River, *Draumond*, n. 35, 36, 87, 386; *4th Coll.* n. 218; *5th Coll.* n. 373; *Pross*, n. 102 and 104; Murchison river, *Oldfield*.

The species is also in New Zealand. The specimens from that country, like some of the Victorian ones, have all the leaves short, obovate or spatulate; from this there is a very gradual passage to the very narrow linear form of some of the Victorian and N. S. Wales specimens. The indumentum is also very variable, sometimes soft, woolly or almost silky, sometimes all scabrous and rigid. The following forms appear to be more distinct, and possibly, when better known, may be regarded as species. On the other hand, *Morayga trifurcata*, Less., from S. America, differs but very slightly in the more villous achenes and narrow-lobed leaves:

Var. dissecta. Leaves often twice 3-lobed. Port Jackson, *R. Brown*; New England, *C. Stuart*; Bent's Basin, *Woods*; Upper Bogan and Lachlan rivers, *L. Morton*; Yarra river, *F. Mueller*.

Var. tenuissimum. Leaves linear-subulate. Flower-heads small. — Port Jackson, *R. Brown*, *Woods*; Burnett river, *F. Mueller* (heads very young, and the identity doubtful).

Var. pterochaeta, F. Muell. Achenes with very fine scarcely conspicuous striæ. Pappus bristles almost plumose. Castlereagh river, *C. Moore*; Darling desert, *Victorian Expedition*.

Var. megaphylla, F. Muell. Flower-heads large. Ray flurts longer than the pappus. — Spencer's Gulf, *F. Mueller*; Tasmania, *Gunn*.

SECTION II. EURYBIOPSIS, A. Gray.—Achenes very flat, the margins slightly thickened, without any ribs on the faces, or very rarely one short obscure rib.

3. **V. scabra**, DC. *Prod.* v. 281. A rigid herb of 1 to 2 ft. with erect branches, or rarely small, somewhat woody at the base and divaricately

branched, scabrous-pubescent or hirsute. Leaves linear-oblong or cuneate, often above 1 in. long, and when broad stem-clasping at the base, entire or with a few coarse obtuse teeth. Flower-heads on peduncles longer than the leaves, usually forming a terminal corymb. Involucre almost hemispherical, the bracts numerous, narrow, acute or almost obtuse, the inner ones scarcely 3 lines long, the outer ones shorter. Ray-florets numerous, in some specimens all exceedingly narrow, almost filiform, and scarcely exceeding the pappus, in others rather broader and longer; disk-florets less numerous, at first but little longer than the involucre, but the ripe pappus much exceeding it. Achenes very flat, with thickened margins and no longitudinal ribs on the faces, sprinkled with appressed hairs. Pappus bristles unequal, scabrous. *V. hispidula*, F. Muell.; A. Gray in Proc. Amer. Acad. v. 118; *Erigeron Vittadinia*, F. Muell. Fragm. v. 87.

Queensland. *R. Brown*: Bustard Bay and Bay of Inlets, *Banks* and *Solander*; rocky hills, Cleveland and Rodd's Bays, *A. Cunningham*; Wide Bay, *Leichhardt*; Gilbert river and Peak Downs, *F. Mueller*; flats on the Murraon, *Mitchell*; Curtis Island, *Henue*.

N. S. Wales. Port Jackson and Paterson's River, *R. Brown*.

4. *V. macrorrhiza*, A. Gray in Proc. Amer. Acad. v. 118. A perennial with a thick woody stock and slender erect not much branched stems of about 6 in., or 1 ft. when luxuriant, glabrous or scabrous-pubescent. Leaves linear, or the lower ones linear-cuneate, $\frac{1}{2}$ in. long or less, or rarely nearly 1 in., the upper ones small and distant. Flower-heads on long terminal peduncles, solitary or very loosely corymbose. Involucre hemispherical, the bracts narrow and acutely acuminate, the inner ones 3 lines long. Ray-florets not quite so numerous as in *V. scabra*, narrow but longer than the pappus, although usually revolute so as to appear shorter; disk-florets fewer, longer than the involucre. Achenes very flat, with thickened margins, without any or with a single short rib on their faces, sprinkled with appressed hairs. Pappus rather unequal. — *Eurybiopsis macrorrhiza*, DC. Prod. v. 260.

N. Australia. Brunswick Bay and Prince Regent's Harbour, N.W. coast, *A. Cunningham*; Providence Hill, *F. Mueller*; Port Essington, *Armstrong*; islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Broad Sound, *R. Brown*, apparently the same species, although with rather longer leaves.

14. *PODOCOMA*, Less.; R. Br.

(*Podopappus*, *Hook. et Arn.*; *Asteropsis*, *Less.*?; *Isiochlamys*, *F. Muell.*).

Involucre broadly ovoid or hemispherical, the bracts imbricate in several rows, narrow, acute. Receptacle without scales. Florets of the ray female numerous, crowded in several rows, ligulate but very narrow. Disk-florets few, hermaphrodite, tubular but slender, usually 5-lobed. Anthers obtuse at the base. Style-lobes somewhat flattened, with narrow tips or appendages sometimes almost subulate. Achenes short, flat, produced into a long or short slender beak. Pappus of numerous capillary bristles.—Perennial herb. Leaves alternate. Flower-heads large, terminal, solitary, or very loosely corymbose.

Besides the Australian species, which is endemic, there are three from extratropical South America. Notwithstanding the confusion arising from Lessing's having described the ray-florets as 1-seriate, there seems little reason to doubt that *Erigeron laevisifolium*, Poir. (or

Podocoma hirsutifolia and *P. parvifolia* (Cass.), is identical with *Podopappus hirsutus*, Hook. et Arn., and *Asteropsis macrocephala*, Less., is most probably the same as *Podopappus tomentosus*, Hook. et Arn. The genus only differs from *Vittadinia* in the beaked achene, the length of the beak varying even in the same species.

1. ***P. cuneifolia***, R. Br. *App. Sturt Exped.* 17. Stems much branched and almost woody at the base, with ascending leafy branches rare, above 4 or 5 in. high, without the peduncles. Leaves crowded, oblong-cuneate or almost linear, acutely toothed or lobed at the end, narrowed into a petiole, mostly above 1 in. long, ciliate as well as the petiole and stem with long rigid white hairs. Peduncles much longer than the leaves. Involucral bracts numerous, linear-lanceolate, acute, the inner ones $\frac{1}{2}$ in. long and coloured at the tips, the outer ones shorter, more or less glandular-pubescent as well as the peduncles. Ray-florets almost filiform, scarcely exceeding the pappus; disk-florets about as long as the involucre. Achenes small, obovate, glabrous or silky-hairy, the filiform beak three or four times as long as the achene itself. Pappus fine and white.—*Leiochlamys cuneifolia*, F. Muell. and Sond. in *Linnæa*, xxv. 466.

N. Australia. Nichol Bay, N.W. coast, *F. Gregory's Expedition.*

N. S. Wales. Mount Gougingberi, *Victorian Expedition.*

S. Australia. Dry river-beds, Cadzuka, Arlaka, etc., *F. Moeller*; in the N. interior, *M'Douall Stuart's Expedition.*

15. ERIGERON, Linn.

Involucre from ovoid to hemispherical, the bracts numerous, narrow, nearly equal or imbricate in several rows. Receptacle flat or slightly convex, without scales. Ray-florets female, numerous, in 2 or more rows either all ligulate or very narrow, or the inner ones shorter and filiform. Disk-florets few or numerous, hermaphrodite, tubular, 5-toothed. Anthers obtuse at the base. Style-branches narrow, somewhat flattened, with lanceolate tips or appendages papillose outside. Achenes flattened, the margins usually thickened. Pappus of copious capillary nearly equal bristles.—Herbs. Leaves alternate or radical. Flower-heads solitary corymbose or paniculate. Ray-florets white pink or purplish.

A large genus, ranging over the greater part of the globe, but chiefly in the temperate regions of the northern hemisphere, or in mountainous tropical regions. Of the five Australian species, two, both probably of American origin, are common tropical weeds also in the Old World, the other three appear to be endemic. The genus is very closely allied to *Aster*, differing chiefly in the more numerous and narrower ray-florets, and even passes into it by almost insensible gradations among the American species, and on the other hand some species of the section *Conotus* might almost equally well be placed in *Conyza*.

SECTION I. Euerigeron.—*Female ray-florets all ligulate in many rows.*

Small tufted perennial. Leaves mostly radical. Scapes one-headed, with few small bract-like leaves or none 1. *E. pappochroma*.
Stems erect, branching, leafy, usually annual.

Flower-heads hemispherical, solitary or corymbose.

Leaves oblong or lanceolate. Pappus-bristles numerous, capillary 2. *E. ambiguus*.

Leaves narrow-linear. Pappus-bristles few, strongly barbellate, very caducous 3. *E. minurioides*.

Flower-heads very small, ovoid in an oblong panicle 4. *E. canadensis*.

SECTION II. *Cœnotus*.—Inner rows or nearly all the female ray-florets filiform and tubular.

Plant nearly glabrous. Flower-heads corymbose. Ligulate florets numerous, rather longer than the involucre 5. *E. conyzoides*.

Plant pubescent or hirsute. Flower-heads in a short panicle. Ray-florets nearly all filiform, the outer ones with a very minute ligula 6. *E. linifolius*.

SECTION I. *Euerigeron*.—Female florets all ligulate, in several rows.

1. *E. pappochroma*, *Labill. Pl. Nov. Holl.* ii. 47. *t.* 193. Stock short, thick, simple or branched and tufted. Radical leaves spreading, from oblong-linear and nearly sessile to broadly obovate or spatulate, and narrowed into a long petiole, entire or remotely toothed, from under $\frac{1}{2}$ in. to above 1 in. long. Stems or scapes simple, usually exceeding the leaves and sometimes above 6 in. long, with a few small narrow linear leaves or bracts, and a single terminal flower-head, the whole plant glabrous or more or less hirsute. Involucre hemispherical, the bracts linear-lanceolate, in about 2 rows, the inner ones 3 to 4 lines long. Ray-florets very numerous, the ligula very narrow, 1 to $1\frac{1}{2}$ lines long; disk-florets not exceeding the involucre.—*DC. Prod.* v. 288; *Hook. f. Fl. Tasm.* i. 182; *E. phlogotrichus*, *Spreng. Syst.* iii. 520.

Victoria. Summits of the Australian Alps, *P. Mueller*.

Tasmania. Summit of Table Mountain, Derwent river, *R. Brown*, and of most of the higher mountains, descending to Recherche Bay, *J. D. Hooker*, etc.

The following varieties, all alpine, appear at first sight to be distinct species, but it is difficult to assign any precise limits to any of them :—

a. stellatus. Glabrous except a few cilia on the margin of the leaves. Stock often elongated. Leaves densely tufted, linear-cuneate, under $\frac{1}{2}$ in. long, scarcely petiolate, coriaceous. Ray-florets fewer and longer than in the other varieties.—*Aplopappus stellatus*, *Hook. f. in Hook. Lond. Journ.* vi. 112; *Erigeron tasmanicus*, var., *Hook. f. Fl. Tasm.* t. 46 A (the left-hand figure).—Tasmania.

b. oblongatus. Glabrous or nearly so. Leaves oblong-spatulate or elliptical-oblong, narrowed into a long petiole, entire, coriaceous. *Aplopappus tasmanicus*, *Hook. f. in Hook. Lond. Journ.* vi. 110; *Erigeron tasmanicus*, *Hook. f. Fl. Tasm.* i. 183. t. 46 A (the right-hand figure).—Tasmania.

c. Billardieri. Glabrous or nearly so. Leaves obovate-oblong or spatulate, narrowed into a long petiole, usually toothed, much thinner than in the last variety.—*Aplopappus pappochroma*, *Hook. f. in Hook. Lond. Journ.* vi. 111. Tasmania.

d. Gunnii. Softly hirsute. Leaves obovate-oblong or spatulate, entire or toothed, not thick. Scapes long or short.—*Aplopappus Gunnii* and *A. bellidioides*, *Hook. f. in Hook. Lond. Journ.* vi. 111, 112; *Erigeron Gunnii*, *Hook. f. Fl. Tasm.* i. 183.—Tasmania and Victoria.

e. setosa. Leaves small, shortly petiolate, oblong or cuneate, entire, thick, hispid with rigid bristly hairs. Scapes very short.—Munyong Mountains, Victoria, *P. Mueller*.

2. *E. ambiguus*, *P. Muell. in Trans. Phil. Inst. Vict.* iii. 53. Stems several, erect or ascending, corymbosely branched, shortly pubescent and somewhat glandular, attaining about 1 ft. in height. Leaves oblong or lanceolate, entire or with a few coarse teeth. Flower-heads small, in a loose terminal corymb. Involucral bracts narrow-linear or subulate, acuminate, the inner ones about 2 lines long. Ray-florets very numerous and slender, but ligulate, slightly exceeding the involucre; disk-florets much less numerous, about as long as the involucre. Style and achenes of the genus.

Queensland. Gilbert river, *F. Mueller.*

3. *E. ? minurioides*, *Benth.* Stems apparently spreading or decumbent, branched, leafy, glabrous or glandular-pubescent near the inflorescence. Leaves narrow-linear, mucronate, acute, bordered by a few minute mucronate or almost hair-like teeth, from under $\frac{1}{2}$ in. to about $\frac{3}{4}$ in. long. Flower-heads solitary, terminating the rather numerous leafy branches. Involucre broadly hemispherical, about 3 lines diameter, the bracts narrow, acuminate, nearly equal, in 2 or 3 rows. Ray-florets numerous and narrow, but the ligule at least 2 lines long, the disk-florets very numerous. Achenes flat and obovate, as in the rest of the genus, but the pappus-bristles not numerous, exceedingly fragile and deciduous and strongly barbellate.

Victoria. Port Phillip, *F. Mueller.* A very distinct plant, of doubtful affinity, with something of the habit of a *Minuria*, but more branched, and, notwithstanding the difference of the pappus, which is nearly that of *Gymnostephium*, appears to be best placed in *Erigeron*. I have thought, indeed, that it might have been some Cape *Gymnostephium*, allied to *G. gracile*, and accidentally introduced, but the disk-florets are certainly fertile, and the involucre and rays are those of *Erigeron*, and not of *Gymnostephium*.

* 4. *E. canadensis*, *Lin.*; *DC. Prod.* v. 289. An erect not much branched annual, of 1 to 3 ft., glabrous or hispid with short spreading hairs. Leaves linear, 1 to 3 in. long, entire or rarely with a few distant teeth. Flower-heads small and very numerous in a large oblong or rarely corymbose terminal panicle, the peduncles very slender. Involucre ovoid, nearly glabrous, the bracts narrow, acute, about 2 lines long. Ray-florets very numerous, slender, but ligulate, scarcely exceeding the involucre, white; disk-florets not so many.

N. S. Wales. Port Jackson, *Woolly*, probably introduced. The species, of American origin, is now common as a roadside weed in most tropical countries, as well as in a great part of Europe.

SECTION II. CENOTUS. Inner rows of the female florets or nearly all filiform, shorter than the style and not expanded into a ligula.

5. *E. conyzoides*, *P. Muell. in Trans. Phil. Soc. Viet.* i. 105; in *Hook. Kew Journ.* viii. 146; and *Fragm.* v. 87. An erect annual, of $1\frac{1}{2}$ to 2 ft., more corymbosely branched than *E. linifolius*, and quite glabrous. Stem leaves linear or lanceolate, often 2 to 3 in. long, quite entire, the radical and lower leaves longer and broader, entire or remotely toothed, narrowed into a long petiole. Flower-heads larger than in *E. linifolius*, forming a terminal corymbose panicle. Involucre hemispherical, the bracts linear-subulate, pointed, in several rows, the inner ones above 3 lines long. Ray-florets exceedingly numerous, the outer 1 or 2 rows ligulate, but so narrow as to be almost filiform, exceeding the pappus, the inner rows filiform, tubular, and shorter; disk-florets very few. Style-appendages short. Achenes small, flat.

N. S. Wales. Tributaries of the Clarence river, *Herb. F. Mueller.*

Victoria. Sources of the Murray and Snowy rivers, at an elevation of 4000 to 5000 ft., *F. Mueller.*

6. *E. linifolius*, *Willd. Spec. Pl.* iii. 1955. A coarse erect annual, 1 to

2 ft. high or rather more, clothed with long soft hairs, or more shortly scabrous-pubescent. Radical leaves petiolate, oblong, often coarsely toothed or pinnatifid; stem leaves sessile, linear, entire or occasionally remotely toothed, often above 2 in. long. Flower-heads rather small, pedunculate, more or less paniculate. Involucre broadly ovoid or almost hemispherical, the bracts narrow, acute, in 2 or 3 series. Female florets very numerous, filiform, not so long as the pappus, the outer ones usually dilated at the tip into a minute ligula, the others all tubular; disk-florets few. Style-appendages short. Achenes small, flat, pubescent.—*Conyza ambigua*, DC. Prod. v. 381; Soud. in Linnaea, xxv. 481; *Erigeron ambiguus*, Sch. Bip. in Phyt. Canar. ii. 203.

Queensland. Brisbane river, Moreton Bay, *P. Mueller*; Rockhampton, a troublesome weed, *Thozet*.

N. S. Wales. Port Jackson, *Woolfs, Backhouse*; Clarence river, *Beckler*.

Victoria. About Melbourne, *Robertson*.

S. Australia. Near Adelaide, and other places about St. Vincent's Gulf, *Behr, P. Mueller*, and others.

W. Australia. *Drummond*, n. 130.

A common tropical weed, found also in Europe. Some of the above enumerated specimens may belong to *E. albidus*, A. Gray in Proc. Amer. Acad. v. 319 (*Conyza albidus*, Willd.), another tropical weed, which, together with other modern botanists, I had set down as *E. bonariensis*, Linn., an error first pointed out by A. Gray. This *E. albidus* has rather smaller flower-heads than *E. linifolius*, and the ligules of the ray rather more developed, approaching nearer to *E. canadensis*, but I now find it scarcely possible clearly to distinguish the two, and, on the other hand, some specimens appear to show no ligula at all, passing as it were into the genus *Conyza*.

16. CONYZA, Linn.

Involucral bracts numerous, narrow, nearly equal or imbricate, in several rows. Receptacle flat or slightly convex, without scales. Ray-florets female, numerous, in several rows, all tubular, filiform, shorter than the involucre. Disk-florets few, hermaphrodite, tubular, 5-toothed. Anthers obtuse at the base. Style-branches narrow, somewhat flattened, with lanceolate tips or appendages papillose outside. Achenes small, flattened, the margins usually thickened. Pappus of copious capillary bristles. Herbs. Leaves alternate, entire, lobed or dissected. Flower-heads usually paniculate.

The genus as above defined, and as understood by De Candolle, comprises a considerable number of species dispersed over the warmer parts of the globe. The Australian species are both of them widely spread over tropical Asia, and one of them is equally abundant in Africa. The genus is closely allied to the section *Cenotus* of *Erigeron*, differing in the total absence of any ligulate expansion of the ray-florets; the softer, more copious pappus, and the larger proportion of female florets to the hermaphrodite ones, give also to the flower-heads a somewhat different aspect. From *Blumea* (to which Schultz-Bipontinus and Miquel propose to transfer the name of *Conyza*) it differs in the want of tails to the anthers.

Tall branching, nearly glabrous, viscid plant. Leaves lanceolate, mostly

entire 1. *C. viscidula*.

Hirsute annuals or biennials.

Leaves narrow, nearly entire *Erigeron linifolius*.

Leaves obovate or oblong, coarsely toothed or pinnatifid 2. *C. aegyptiaca*.

1. *C. viscidula*, *Wall.*; DC. Prod. v. 383. A tall, erect, branching



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